MACHINERY

SEPTEMBER 6, 1961 ONE SHILLING & THREEPENCE

DETROIT PUBLIC LIBRARY
SEP 25 1961
TECHNOLOGY DEPARTMENT

STRAIGHT SIDED
DOUBLE ACTION
2 & 4 POINT
SUSPENSION
POWER PRESSES
550 tons upwards

Photo by courtesy of Standard Triumph International.

WILKINS & MITCHELL

THE PRESSES THAT CUT COSTS

WILKINS & MITCHELL LTD.
BARLASTON • S. STAFFS • ENGLAND

DID YOU SAY
BROOCHES?

Oh! B-R-O-A-C-H-I-N-G!

Then get in touch with H.A.P. They operate a comprehensive Broaching service. They will cut and grind the spline shafts on the same assembly.

CONSULT H.A.P. FIRST!

THE GEAR SPECIALISTS

INDLE UTO | RODUCTS LTD
HAPCO WORKS · CALEDONIA STREET · BRADFORD 5
Phone: BRADFORD 27234-5-6-7 Grams: HAPCO BRADFORD

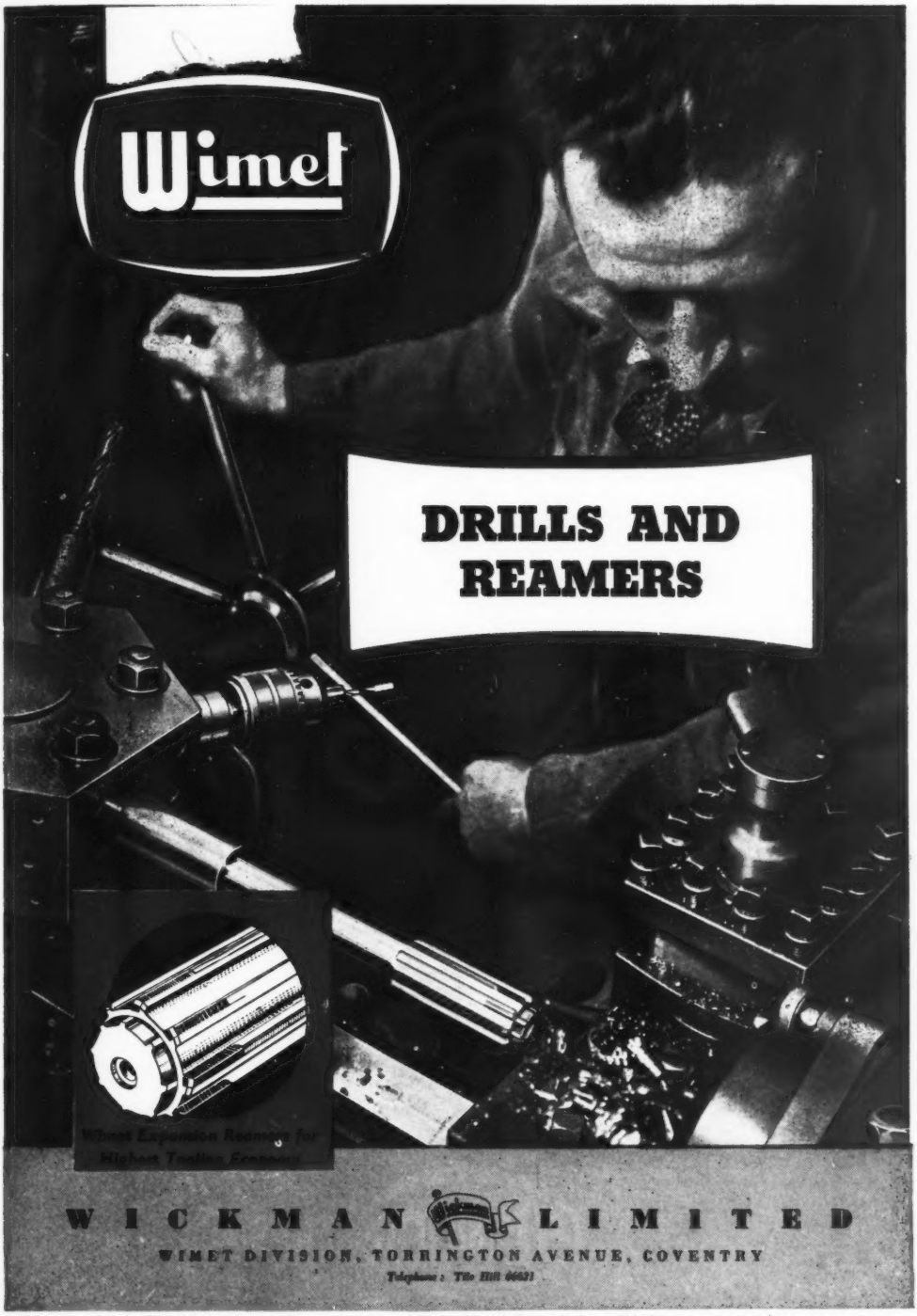
BRAYSHAW
TOOLS LIMITED
BELLE VUE WORKS,
MANCHESTER 12.
Phone: EASt 1046 (3 Lines)
Grams: Hardening M/C.

HiFEED serrated heavy duty cutters are designed to provide a combination of high rate of stock removal and good surface finish.

Some of the advantages to be obtained are:—
SINGLE POINT CUTTING EFFICIENCY.
REDUCED LOAD AND VIBRATION on machine and work.
INCREASED PRODUCTION, particularly on work hardening and high tensile materials.
EFFICIENT HEAT DISSIPATION resulting from the break up of the cutting edges enables **HIGHER FEEDS AND SPEEDS** to be employed.

Primarily designed for heavy stock removal HiFEED cutters produce a surface finish acceptable for most applications. An alternative design, offering similar advantages plus superior surface finish when required, is also available.
HiFEED cutters INCREASE production REDUCE costs.
Send to-day for your copy of leaflet S.T.603.

G!
ensive
afts on
T!
D 5
FORD

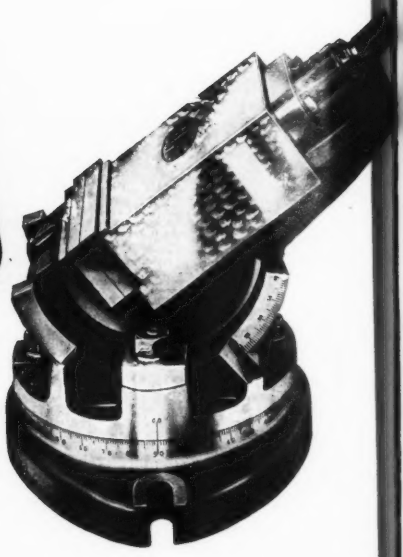


"Wimet" is the registered trade mark of Hard Metal Tools Ltd., a Wickman associated company.

492 ST
A

ABWOOD

UNIVERSAL MACHINE VICES AND COMPOUND ANGLE TABLES FOR ALL ACCURATE WORK



Suitable for jig boring, grinding, milling and shaping machines. Movements are fully indexed through 360° in the horizontal plane and 90° in the vertical. Any combination of angles can be obtained.

Available with 4" and 6" jaw widths. Accurately indexed for angular work with spot sight and knife edge for register. Note the clean design, low height and rigid mounting. Angles cannot alter once the clamps have been locked.

Universal table fitted with interchangeable table. Changeover from circular to rectangular table is readily effected by loosening clamping bolts.
Available in two sizes. Circular 6" and 8" diameter. Rectangular 8" x 6" and 10" x 8".

ABWOOD

ABWOOD MACHINE TOOLS LTD., PRINCES ROAD, DARTFORD, KENT

Telephone : Dartford 25271 (5 lines)

Telegrams: ABWOOD DARTFORD

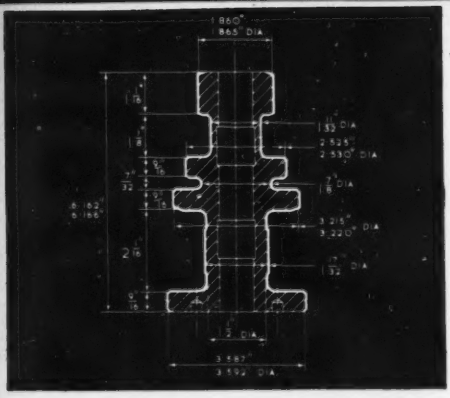
Accu-
h spot
Note
rigid
ce the

geable
rect-
posen-

and 8
x 8'.

KENT
TFORD

FORD TRANSMISSION COUNTERSHAFT GEARS



MACHINED IN 45 SECONDS

This 12-spindle No. 10 Ryder Verticalauto produces two machined transmission countershaft gears at each index.

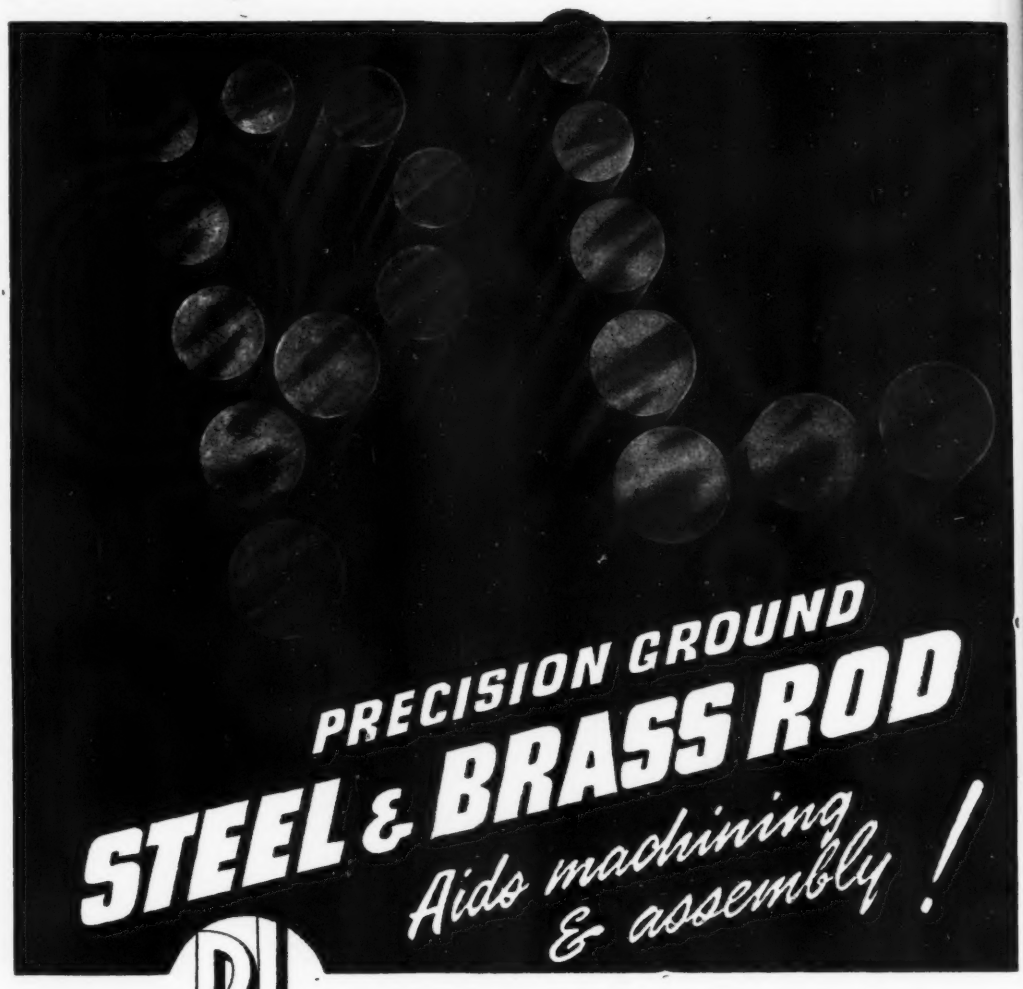
Stellite and H.S.S. Tools cutting at moderate speeds and feeds have eliminated swarf problems and hydraulic operation of the mandrels and automatic hydraulic operation of the Loose Headstocks make loading easy to achieve within the cycle time.

Ryder

VERTICALAUTO

Thos. Ryder & Son, Limited, Turner Bridge Works, Bolton, England.
Makers also of single spindle Rydermatics and Piston Ring Lathes.

WIN half the battle BEFORE you start!



PL

SIZES FROM $\frac{1}{16}$in. TO 1$\frac{1}{4}$in. DIAMETER SUPPLIED TO LIMITS OF ±0·00025in. SIZES ABOVE 1$\frac{1}{4}$in. TO 3in. DIAMETER SUPPLIED TO LIMITS OF ±0·0005in. LENGTHS FROM 6ft. TO 30ft. ALL WITH FLAWLESS SURFACE FINISH.

PRATT, LEVICK & CO. LTD.

CHESTER · ENGLAND

TELEPHONE: CHESTER 22265/6

When answering advertisements kindly mention MACHINERY.

Tapershank performance... Jobber's cost

Clarkson TaperFast System

For you TaperFast means an immediate reduction in your drilling expenditure. For every size of Jobber Drill you use from $\frac{1}{8}$in.—$\frac{1}{2}$in., A—Z or 1—31, you can now use a Tapershank Drill, but it will cost you no more than you are now paying for your Jobbers. This means that you can have Tapershank performance at Jobber's price.

If you want to know more about this new advance in drilling technique, all you have to do is to write or phone your nearest Clarkson Service Centre.

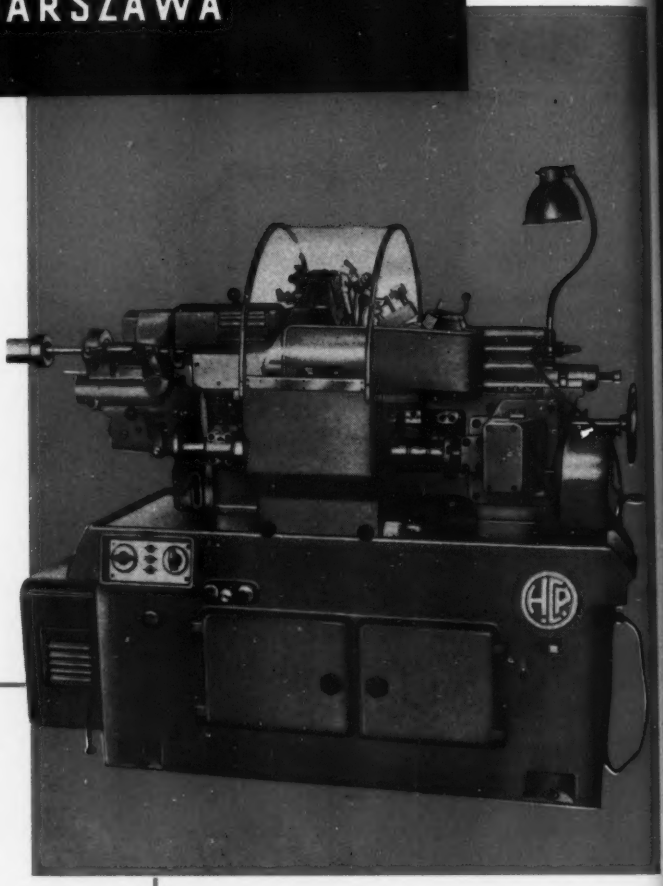
NUNEATON–Warwickshire, *Nuneaton 2261* · LONDON–124 Hammersmith Road, W.6, *Riverside 8241* · BIRMINGHAM–15 Heath Mill Lane, 9, *Victoria 3994*–45 Villa Road, 19, *Northern 5994* · BELFAST–32 Shaftesbury Square, *Belfast 20025* · BRISTOL–17 Cumberland Street, 2, *Bristol 2–8464* · COVENTRY–119 Leicester Causeway, *Coventry 27158* · LEEDS–93 Hunslet Road, 10, *Leeds 26369* GLASGOW–430 Crown Street, C.5, *South 1942* · HAYES (Middlesex)–Springfield Road, *Hayes 7870* · MANCHESTER–98 Oxford Road, 13, *Ardwick 4804* · NEWCASTLE–241 Westgate Road, 1, *Newcastle 2–5248* · WOLVERHAMPTON–13 Dudley Road, *Wolverhampton 25443*

METALEXPORT
WARSZAWA

Invite you to the

POLISH MACHINE-TOOLS SHOW ROOM
in
BRUSSELS
32 rue de Brabant
phone 17-04-66

September 2nd to 20th, 1961
9 a.m. till 6 p.m.

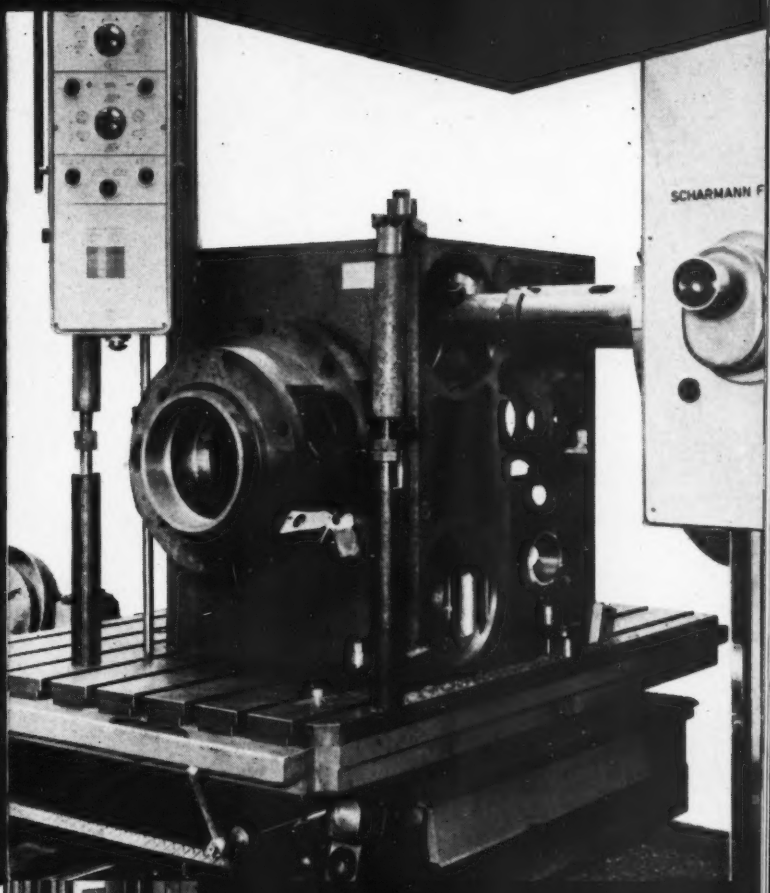


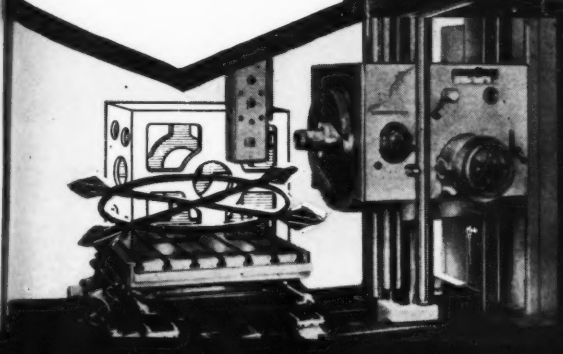
The following machines chosen from our ample export range will be exhibited at the SHOWROOM

AUTOMATIC LATHE ATL-40
AUTOMATIC LATHE BPU-4
AUTOMATIC LATHE BPU-12
UNIVERSAL LATHE TUB-32
PRODUCTION COPYING LATHE TPD-24
UNIVERSAL MILLING MACHINE FWA-31
VERTICAL MILLING MACHINE FYC-25
HYDRAULIC SAW CRB-710
RADIAL DRILLING MACHINE Wrs-25/08
UNIVERSAL GRINDING MACHINE SWA-25

SOLE EXPORTERS:
METALEXPORT
WARSAW — POLAND
Mokotowska 49

HEAVY DUTY





This universal and horizontal boring machine is optically controlled. It is also a heavy duty milling machine with a large facing capacity.

The Opticut reduces operating time substantially as far less time is required for spacing, resetting and realigning, particularly when engaged on 180° index boring. There is no guesswork—with the Opticut you see everything—the speeds, feeds and settings are readily visible on the pendant. The Scharmann Opticut is extremely accurate—the concentric headstock suspension ensures absolute stability under mechanical stress and varying thermal conditions.

Write today for Booklet 1704-A which fully describes this machine.

TAS/CC81

CHARLES CHURCHILL & COMPANY LIMITED

Coventry Road South Yardley Birmingham 25

Telephone Acocks Green 2281

PRESSING FOR PRODUCTION • • •

The pressing assembly as produced by HOOVER Ltd for their KEYMATIC Washing Machine in their Merthyr Tydfil Press Shop illustrated on the opposite page.

THE APPLIANCE FIELD

The preference of so many of the busiest manufacturers in the appliance industries for Wilkins & Mitchell Power Presses, especially in their most recent installations, is based on their need for higher productivity. Throughout the world, users have learned to rely on the design, dependability and built-in reserves of Wilkins & Mitchell Presses .. the complete press shop .. or the single press. Why not consult us on your press requirements?

WILKINS & MITCHELL PRESSES (150 to 350 tons—36" to 108" between uprights) at work on HOOVERS latest washers,

WILKINS & MITCHELL

The Presses that cut costs

WILKINS & MITCHELL LTD . DARLASTON . S. STAFFS . ENGLAND

See the NEW

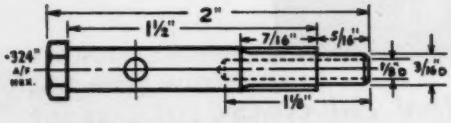
OOB and OOC AUTOMATICS

with the Brown & Sharpe built-in precision & quality plus all the features you will want to take advantage of

TYPE 00B

CHAIN DRIVEN BALL-BEARING SPINDLE WITH A MAXIMUM SPEED OF 7200 R.P.M.

- ¼in. BAR CAPACITY
- 1¼in. TURNING LENGTH
- ALL NEW TURRET SLIDE WITH CONSTANT WITHDRAW OF 25/32in. CAN BE FITTED WITH RAPID PULL OUT ATTACHMENT FOR DEEP HOLE DRILLING
- GREATER TOOL & SWARF CLEARANCE
- NEW LUBRICATOR SUPPLIES OIL TO ALL BEARINGS
- ATTACHMENTS FROM PREVIOUS MODELS FIT OOB
- PUSH BUTTON STATION FOR START, STOP & INCH



MATERIAL: LEDLOY

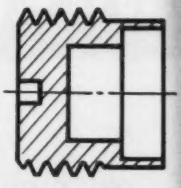
EQUIPPED WITH CAMS AND TOOLING TO PRODUCE THIS STEEL COMPONENT IN 22 SECS. THE MACHINE IS FITTED WITH RAPID PULL OUT VERTICAL SLIDE, BRAKE IN NEUTRAL, CROSS DRILLING AND FLASHING STOPLIGHT ATTACHMENTS.

TYPE 00C

CHAIN DRIVEN NON-REVERSING BALL BEARING SPINDLE WITH A MAXIMUM SPEED OF 10,000 R.P.M.

- ¼in. BAR CAPACITY
- 1¼in. TURNING LENGTH
- ALL NEW TURRET SLIDE WITH CONSTANT WITHDRAW OF 25/32in. CAN BE FITTED WITH RAPID PULL OUT ATTACHMENT FOR DEEP HOLE DRILLING
- GREATER TOOL & SWARF CLEARANCE
- NEW LUBRICATOR SUPPLIES OIL TO ALL BEARINGS
- ATTACHMENTS FROM PREVIOUS MODELS FIT OOC
- PUSH BUTTON STATION FOR START, STOP & INCH

EQUIPPED WITH CAMS AND TOOLING TO PRODUCE THIS BRASS COMPONENT IN 2 SECS. THE OOC IS FITTED WITH VERTICAL SLIDE AND SCREW SLOTTING ATTACHMENTS.



MATERIAL: BSS 240
SCALE: 5:1

si

N-
EARING
AXIMUM
.M.

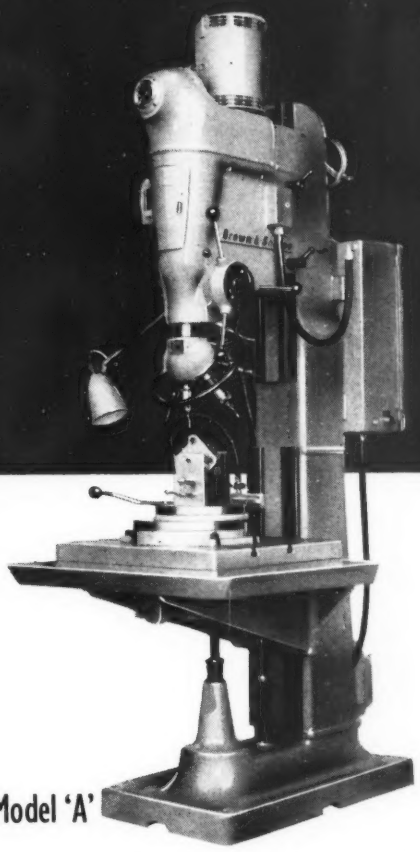
ENGTH
NSTANT
WITH
P HOLE

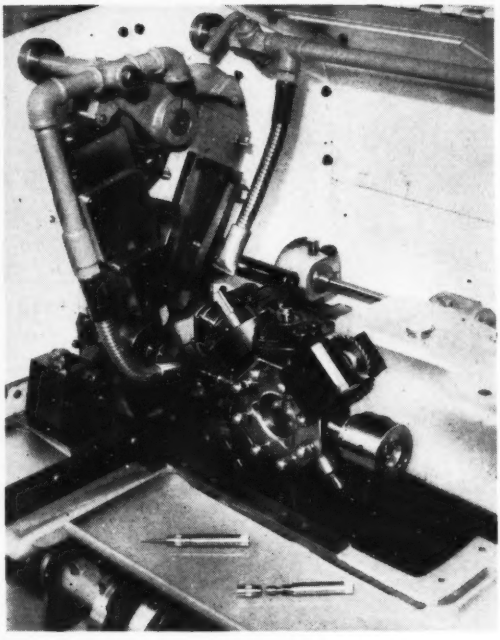
ARINGS
IT OOC
& INCH

S 240

Brown & Sharpe at Brussels

STAND No. 2105
HALL 2





Model 'A'

TURRET DRILLING MACHINE

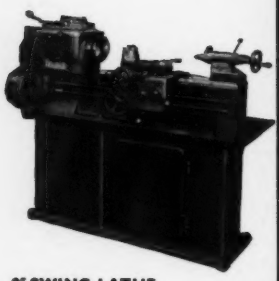
With six precision-indexing spindles on a single axis, the BROWN & SHARPE turret drilling machine will give production increases of up to 500% over conventional machines. Special work-positioning table cuts the need for expensive jigs and fixtures too. Only working spindle revolves and stops control depth within 0.002in. Drill capacity is up to $\frac{1}{2}$in. diameter. Spindle speeds infinitely variable between 200 and 4000 r.p.m. *Write for complete details.*

REPRESENTATIVES IN ALL COUNTRIES

Brown & Sharpe Limited

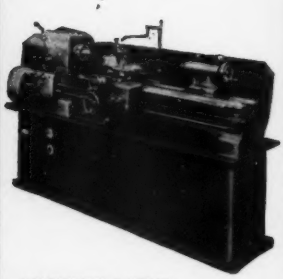
PLYMOUTH, DEVON, ENGLAND. Telephone: Plymouth 31281. Telegrams: Sharpe, Plymouth

B·S



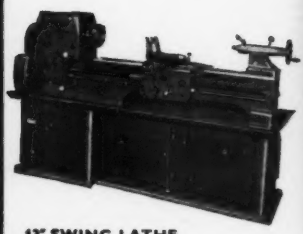
9" SWING LATHE

4½" centres. Between centres 24". 8-speed all-geared head. 1½ h.p. motor. Available with extras such as quick change gearbox with 36 speeds and feeds and bed to admit 40" centres.
Basic price £345.



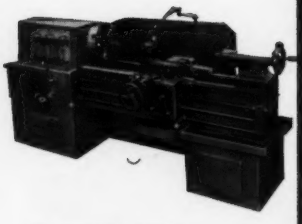
12" SWING LATHE

6" centres. Between centres 24" or 40". Speeds and feeds 36. Spindle speeds 45-1000, 34-1500 or 45-2000.
Basic price £475.
With copying equipment:
Basic price £815.



13" SWING LATHE

6½" centres. Between centres 40". Spindle speeds 9 or 18. Speed range 35-750, 59-1250, 41-1750.
Basic price £645.
With copying equipment:
Basic price £995.



17" SWING LATHE

8½" centres. Between centres 40". Spindle speeds 12. Speed range 35-1500.
Basic price £1350.
With copying equipment:
Basic price £1800.

HORIZONTAL MILLING MACHINE

With longitudinal power to table 30" x 8". Traverse: longitudinal 15", cross 6½". All-geared drive, 2 h.p. motor with clutch and brake. Eight speeds 67-1500. **Basic price £415.**
With automatic cycle:
Basic price £500.

DOUBLE ENDED, GENERAL PURPOSE GRINDER

Can be supplied with coolant, eye shields, twist drill attachment or arranged for side grinding. Standard model 14" x 2" wheels, 3 h.p. motor.
Basic price £131.10.0.

the Harrison range – a businesslike equation of price and performance.....

Harrison policy is to provide productive capacity and reliability well above price. Ask for literature and assess this claim.

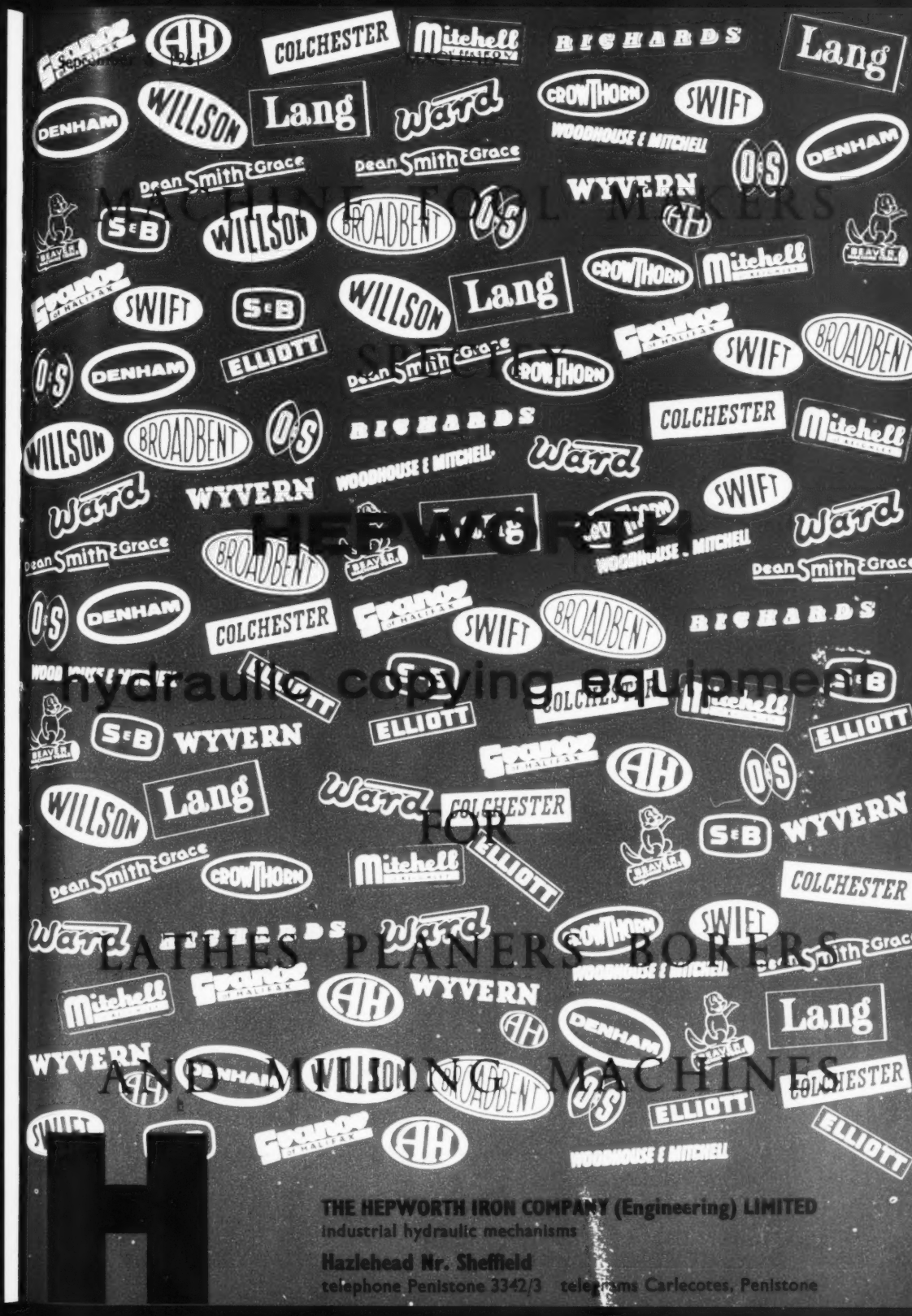
Literature available covers the Harrison range of lathes from 9 to 17 swing; Milling, Drilling, Grinding, Lapping Machines; Engineers' Accessories.

TICK THE MACHINES THAT INTEREST YOU AND ATTACH THIS ADVERTISEMENT TO YOUR LETTERHEAD.

Harrison

T. S. HARRISON & SONS LIMITED, HECKMONDWIKE, YORKSHIRE

6, 1961

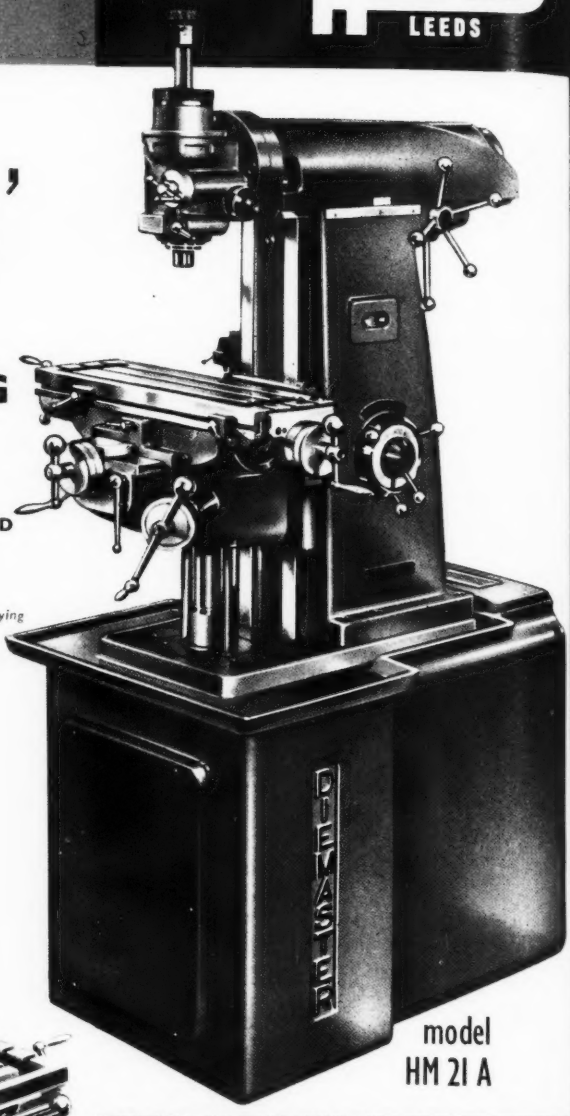

MACHINE TOOL MAKERS
SPECIALISTS
HEPWORTH
hydraulic copying equipment
FOR
LATHES PLANERS BORERS
AND MILLING MACHINES
THE HEPWORTH IRON COMPANY (Engineering) LIMITED
industrial hydraulic mechanisms
Hazlehead Nr. Sheffield
telephone Penistone 3342/3 telegrams Carlecotes, Penistone

Hayes
LEEDS

'DIEMASTER'

PRECISION VERTICAL MILLING MACHINE

WITH HARDENED & GROUND THREAD LEAD SCREWS



model HM 21 A

	HM 21 A	HMH 26 A with Hydraulic Copying
Table size	21" × 6½"	26" × 8½"

TRAVERSE DIMENSIONS

Table (Longitudinal) ...	12"	13"
Underslide (Lateral) ...	5"	5"
Knee (Vertical) with Vertical Milling Head ...	13¼"	13¼"
Knee (Vertical) with Horizontal Milling Head	16"	16"
Hydraulic Vertical Traverse	—	2½"
Maximum Height under Spindle Nose	13¼"	13¼"
Overarm Traverse ...	7¼"	7¼"
Working Area	12" × 12"	12" × 13"
9 Spindle Speeds	50-2,400 r.p.m.	50-2,400 r.p.m.

ADDITIONAL EQUIPMENT

High Speed Milling Head. 6 Spindle Speeds 1,000 to 6,000 r.p.m.
Horizontal Milling Heads. Jig Boring Equipment.
8" and 11" diameter Rotary Tables.

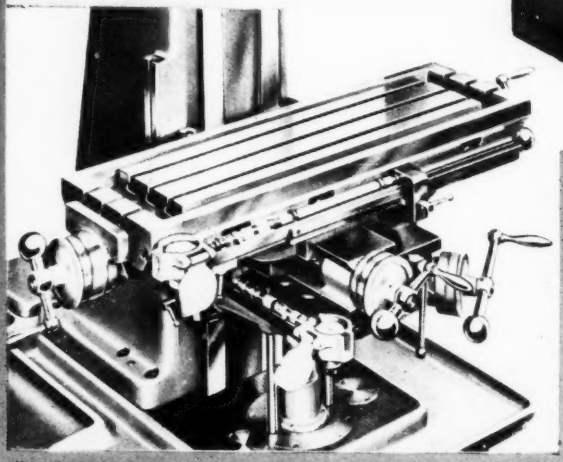


ILLUSTRATION SHOWS THE JIG BORING ATTACHMENT

HAYES ENGINEERS (LEEDS) LTD.

GELDERD ROAD, LEEDS 12

TELEPHONE: LEEDS 30941

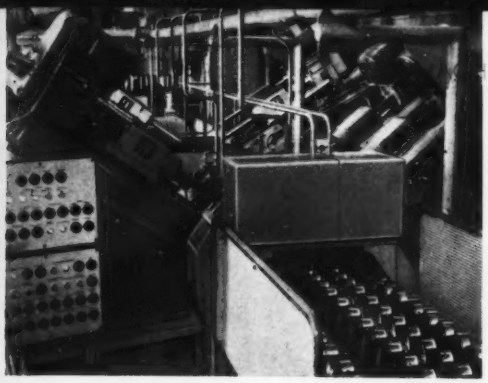
TELEGRAMS: TOOLMAKER LEEDS 12

es

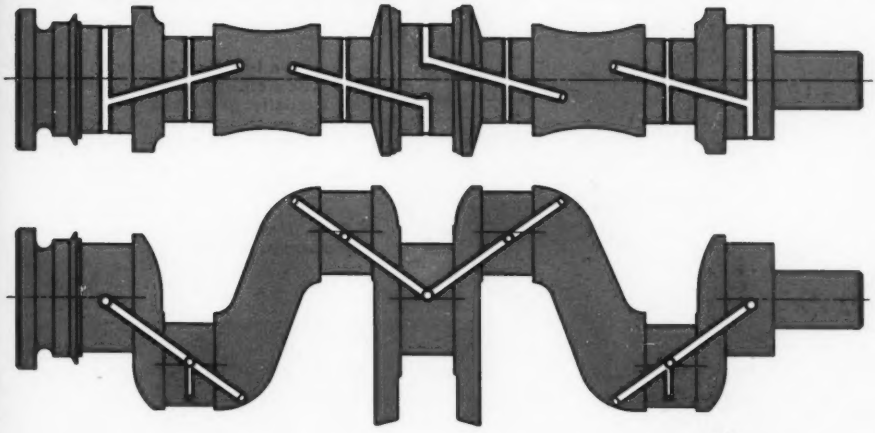
EERS

DS 12

EDS 12



Hüller



Karl Hüller GmbH. Ludwigsburg

Deephole Drilling

On this automatic transfer-line all oil holes are drilled in four cylinder engine crankshafts.

Eight B.T.H. deep hole drilling units and four vertically arranged slide units are employed.

Load and unload is automatic, and a production of 32 parts per hour is obtained

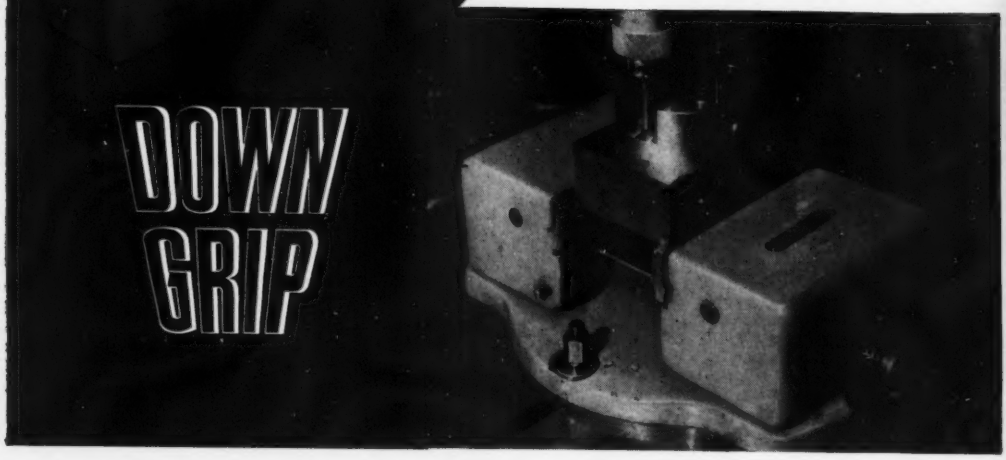
Bishop, Eaves & Sons, Ltd.

Telephone : East 4071
Telex 33461 Bisheaves Birmingham

EVEN ON A JIG BORER...

Here is a Machine Vice with built-in precision. As its name implies, it actually grips the work hard down on to its table or parallels. An accurate set-up in seconds!

The illustrations show the boring of a location pin hole in a fuel pump assembly fixture at the premises of Messrs. AC-Delco, Liverpool, by whose courtesy the photographs are reproduced.



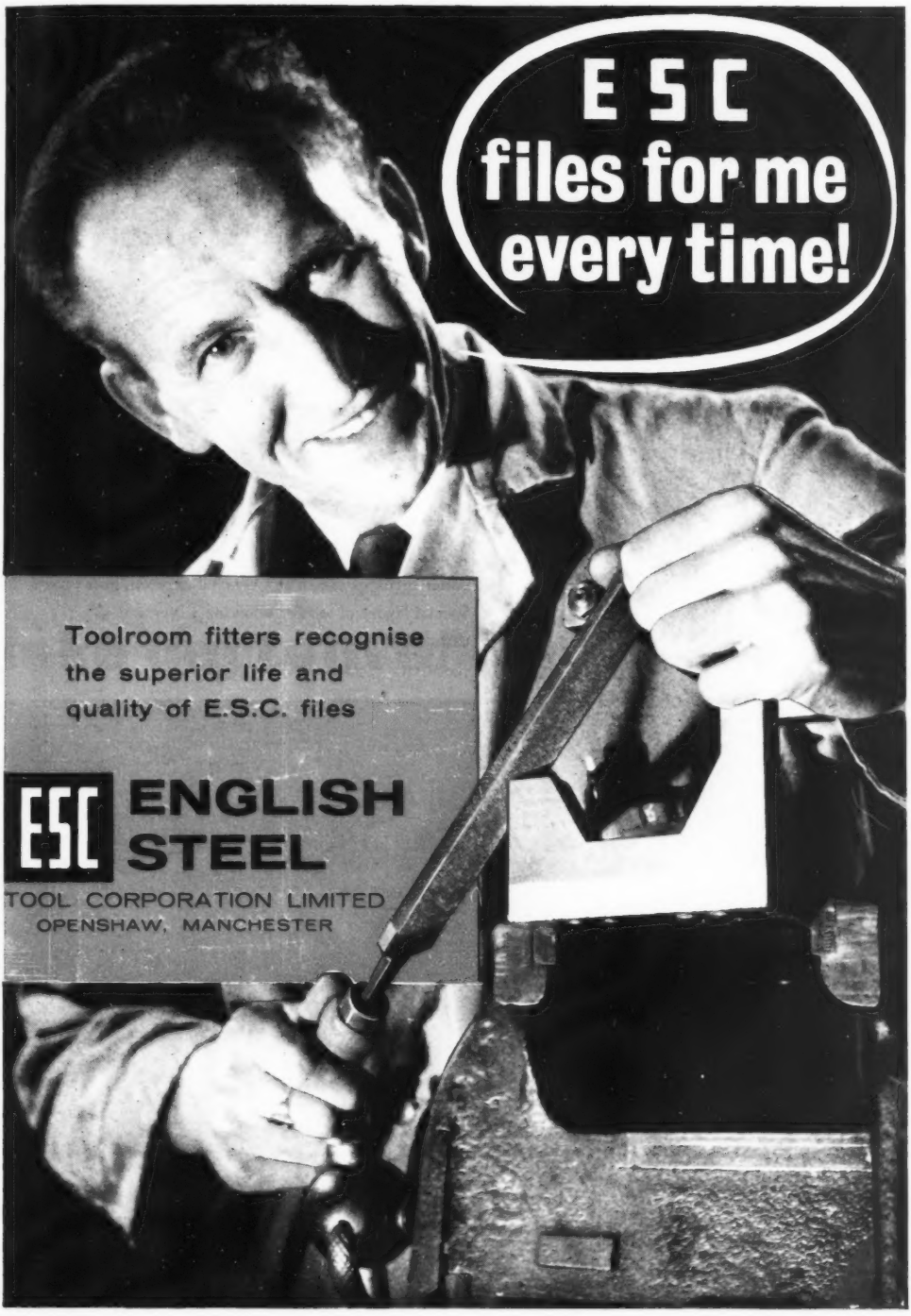
✳ BUILT AS A MACHINE TOOL — FOR EFFORTLESS PRECISION

VISIT OUR STAND No. 7404 • 7th EUROPEAN MACHINE TOOL EXHIBITION
BRUSSELS · SEPTEMBER 3-12, 1961

THE SHEFFIELD TWIST DRILL AND STEEL COMPANY LIMITED
SHEFFIELD ENGLAND

DORMER TOOLS ARE OBTAINABLE FROM YOUR USUAL ENGINEERS' MERCHANTS

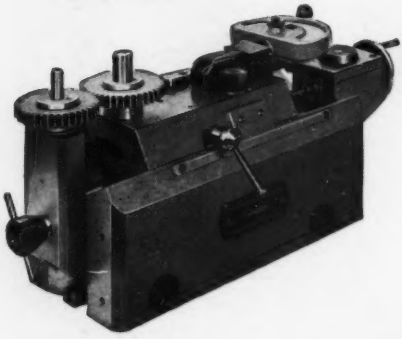
6, 1961


E S C
files for me
every time!
Toolroom fitters recognise
the superior life and
quality of E.S.C. files
ESC ENGLISH
STEEL
TOOL CORPORATION LIMITED
OPENSHAW, MANCHESTER

Goulder

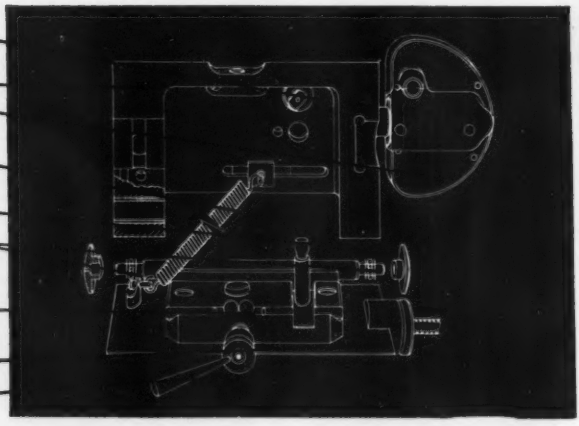
GEAR MEASURING EQUIPMENT

This series of advertisements is intended to show how attention to detail design backed by careful and precise manufacture has made Goulder gear measuring equipment first choice of buyers who appreciate these qualities.



ROLLING TESTER SADDLE ASSEMBLY

used on Goulder No. 1 Rolling Tester to measure variations in centre distance as two gears are rolled together under spring pressure and hence composite gear errors. Special layout of saddles allowing 1, vertical adjustment for gear under test 2, extra sensitivity 3, reduced bed length.

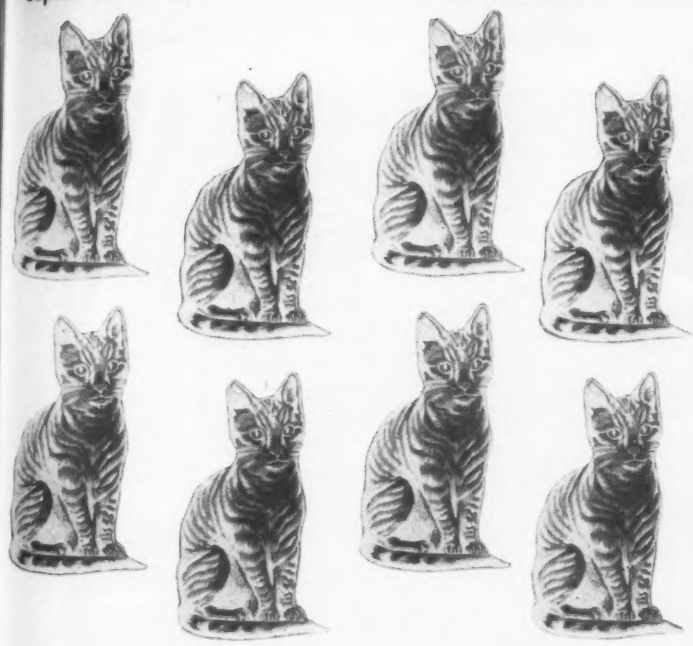


- CAM ACTION CENTRALISING LOCK TO PROVIDE DATUM
- FLOATING SADDLE IN NITRALLOY STEEL
- MICRO-INDICATOR AS ALTERNATIVE TO ELECTRONIC RECORDER
- SPRING TO PROVIDE ADJUSTABLE MEASURING PRESSURE
- STYLUS ABUTMENT PEG
- REAR BEARINGS CONSISTING OF TWO RINGS OF BALLS CARRIED ON A HARD STEEL SHAFT IN A HARD STEEL BUSH
- FRONT BEARINGS CONSISTING OF TWO BALLS CARRIED IN HARD VEE AND FLAT BEARINGS
- SLIDING SADDLE IN HARDENED NITRALLOY STEEL
- CAM ACTION LOCK FOR CENTRE DISTANCE SETTING

Goulder *THE NAME FOR ALL GEAR TESTING*

J. Goulder & Sons Ltd., KIRKHEATON, HUDDERSFIELD. *Tel: Huddersfield 5252-3*

JG17



EXTRA LIFE

make certain of that with SUPER CAPITAL TOOL BITS

CAT'S WHISKER POINTS TO NOTICE:—

★ HIGH CARBON - HIGH VANADIUM - HIGH SPEED.

★ EXTREME RESISTANCE TO ABRASION.

★ FOR ROUGH AND FINISH TURNING OF TOUGHEST MATERIALS.

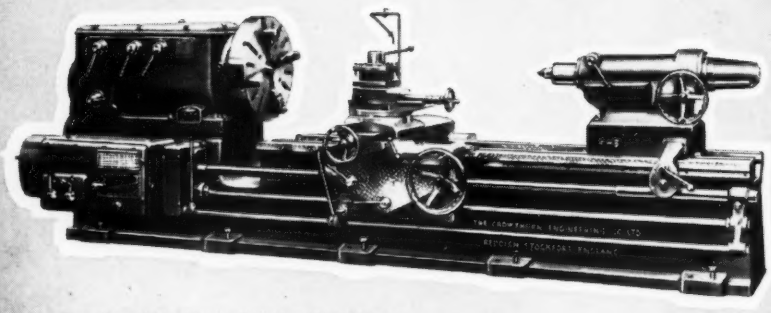
★ PRODUCTION CONTROLLED AND TESTED IN BALFOUR'S OWN WORKS FROM THE MELT TO THE FINISHED PRODUCT

★ AVAILABLE IN SHEFFIELD, AND FROM BRANCH OFFICE STOCKS IN LONDON, BIRMINGHAM, MANCHESTER, GLASGOW AND CARDIFF.

STEEL & TOOLS **ARTHUR BALFOUR** FOR THE WORLD

ARTHUR BALFOUR & CO LTD. CAPITAL STEEL WORKS, SHEFFIELD ENGLAND.
ASSOCIATED COMPANY: THE EAGLE & GLOBE STEEL CO, LTD.

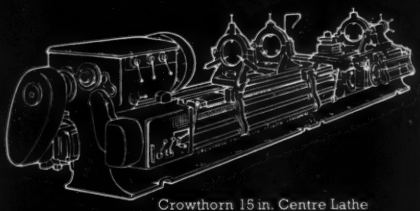
See us at STAND NO. 3212 HALL NO. 3,
7th EUROPEAN MACHINE TOOL EXHIBITION, BRUSSELS from SEPT: 3rd - 12th.



Crowthorn 18 in. Centre Lathe on 15 ft. 3 in. gap bed, admitting 8 ft. 0 in. between centres. Swing over bed 36¾ in. Swing in gap 57 in. × 21 in., hole through spindle 4⅛ in. dia. 25 h.p. motor drive.

CROWTHORN

HEAVY DUTY LATHES



Crowthorn 15 in. Centre Lathe on 31 ft. 0 in. gap bed.

Crowthorn long bed heavy duty Lathes can be supplied with any length of bed to suit customers' requirements. A full range of fittings and attachments is available.

* *Send for new fully illustrated literature*

CROWTHORN ENGINEERING COMPANY LIMITED

MAKERS OF HIGH CLASS MACHINE TOOLS FOR OVER HALF A CENTURY

REDDISH · STOCKPORT · ENGLAND

PHONE: STOCKPORT 7271 - 2 - 3

GRAMS: CROWTOOL, REDDISH

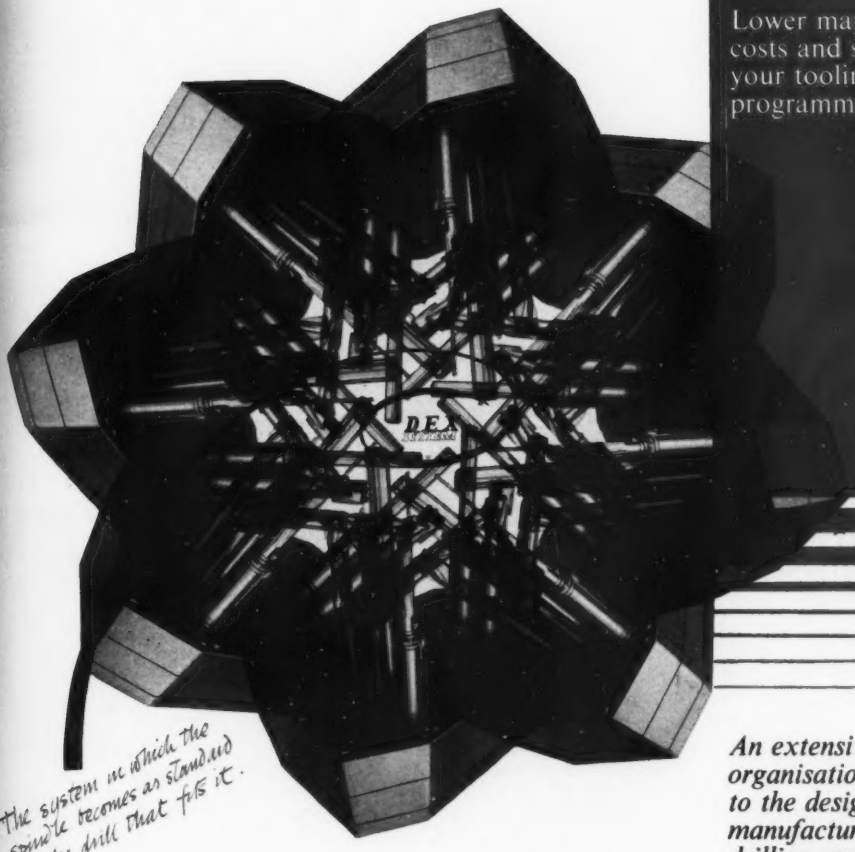
Multi Drilling

DEX SYSTEM multi drilling gives Multi-Head standardization

Off the shelf service for standard parts

Savings in drawing office time

Lower manufacturing costs and speeds up your tooling programmes.



The system in which the spindle becomes as standard as the drill that fits it.

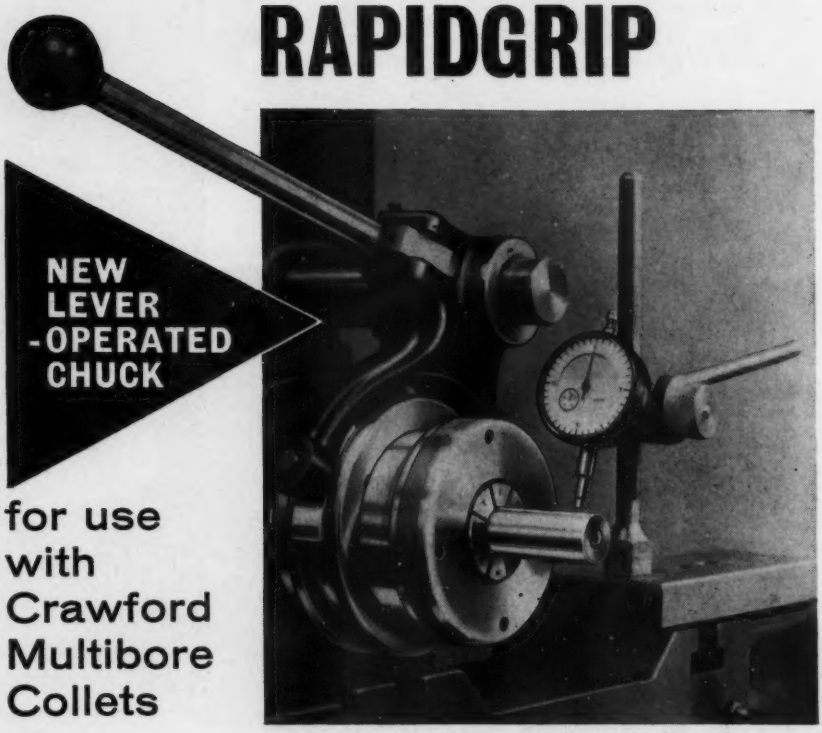
An extensive organisation devoted to the design and manufacture of multi drilling equipment.

Designex (Coventry) Limited,

Coventry Road,
Exhall, Coventry.
Phone Bedworth 2081

MEMBER OF THE DOWTY GROUP OF COMPANIES

CRAWFORD RAPIDGRIP



for use with Crawford Multibore Collets

This powerful new dead-length chuck is particularly suitable for bar and second operation work; fitted with a Crawford rear support stop it can hold exceptionally short pieces. It is designed for operating the Crawford Multibore Collets with their ¼" size range. There's less operator fatigue, too, because Rapidgrip's simple, powerful rack and pinion gear is easier to operate than more direct lever systems of collet closing. Another special feature is the fixed front cap which ensures constant accuracy. An independent key allows easy bore adjustment.

CRAWFORD COLLETS LIMITED
Witney • Oxon
Witney 334

London Stockists: Acbars Limited, 16-18 Macleod Street, Walworth Road, London SE17 Rodney 7191

Midland and N.W. England Stockists: Retselp Engineering Limited Vulcan Road Industrial Site Lode Lane Solihull Birmingham Solihull 2239

Agents for N.E. England: Alfred Herbert Limited Carliol Square Newcastle 1 Newcastle 28684

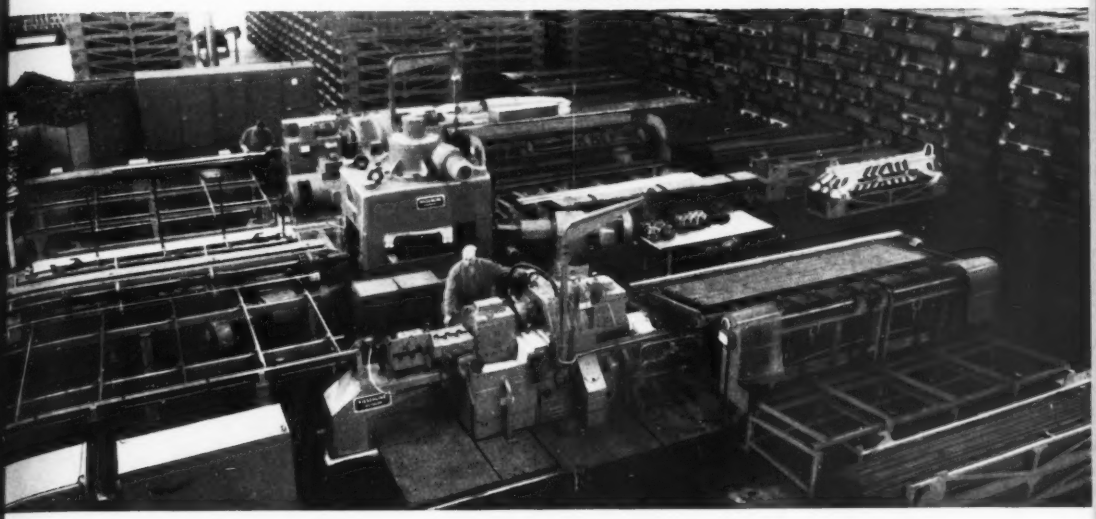
Agents for Scotland: R. McSkimming & Co 65 West Regent Street Glasgow C2 Douglas 7391-2

C6

TH. KIESERLING & ALBRECHT

MACHINE TOOL MANUFACTURES · ESTABLISHED 1873

SOLINGEN · GERMANY



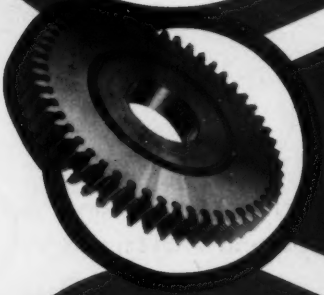
AUTOMATIC BAR TURNING, STRAIGHTENING and POLISHING PLANT

with each one centreless bar turning machine working with carbide cutters, model WDH 0 and WDH 1, and straightening and polishing machine, model WRPT 5, for a bar diameter range from 12 up to 80 mm.

British Agent: F. W. KUBACH Ltd., Wakefield House, 106 Church Road, London, S. E. 19

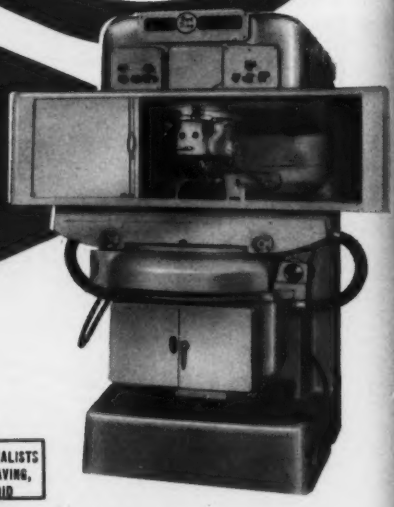
are showing at the 7th European Machine
l Exhibition at Brussels from September
to 12th 1961, Stand 8110, Hall 8.

This steel overdrive transmission planetary pinion was shaved in 12 seconds . . . . . .



. . . . by a Gear Shaving Cutter

. . . . on a Model G.C.U. Gear Shaving Machine



SPUR AND HELICAL GEAR SPECIALISTS
ORIGINATORS OF ROTARY SHAVING, GEAR HONING AND ELLIPTOID

PRECISION GEAR MACHINES & TOOLS LIMITED

(An Associate Company of National Broach & Machine Co., Detroit, U.S.A.)
"World's Largest Producer of Gear Shaving Equipment"

RED RING WORKS, BODMIN ROAD, COVENTRY

Telephone: Walsgrave-on-Sowe 2372 *Telegrams:* Pregearmac, Coventry

MEDDINGS

Hydraulic Multi-spindle drilling machines

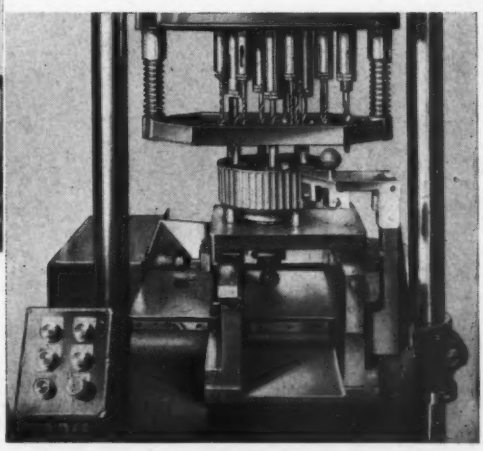
Visit us on Stand
6103, HALL 6
7th European Machine Tool Exhibition, Brussels, September 3—12

These hydraulic up-stroking multi-spindle drilling machines provide fast approach, accurately controlled drilling feed and fast return of the worktable after completion of drilling. They are extremely flexible in use and can be fitted with driving motors of up to 15 h.p. — the thrust available from standard machines can be varied up to 8,000 lbs.

The machine illustrated is one of two recently supplied to a customer for the quantity production of Brake components. Provision is made for fast changeover of multi-spindle Heads and tooling, and the machines were supplied complete with all necessary jigs and fixtures built to customer's requirements.

'Patterning' of multi-spindles enables one machine to cater for a number of different parts — Heads with up to 90 spindles are in course of production.

A complete range of fixed centre and adjustable type multi-spindle Heads for attachment to existing machines, together with a comprehensive tooling service are also available.

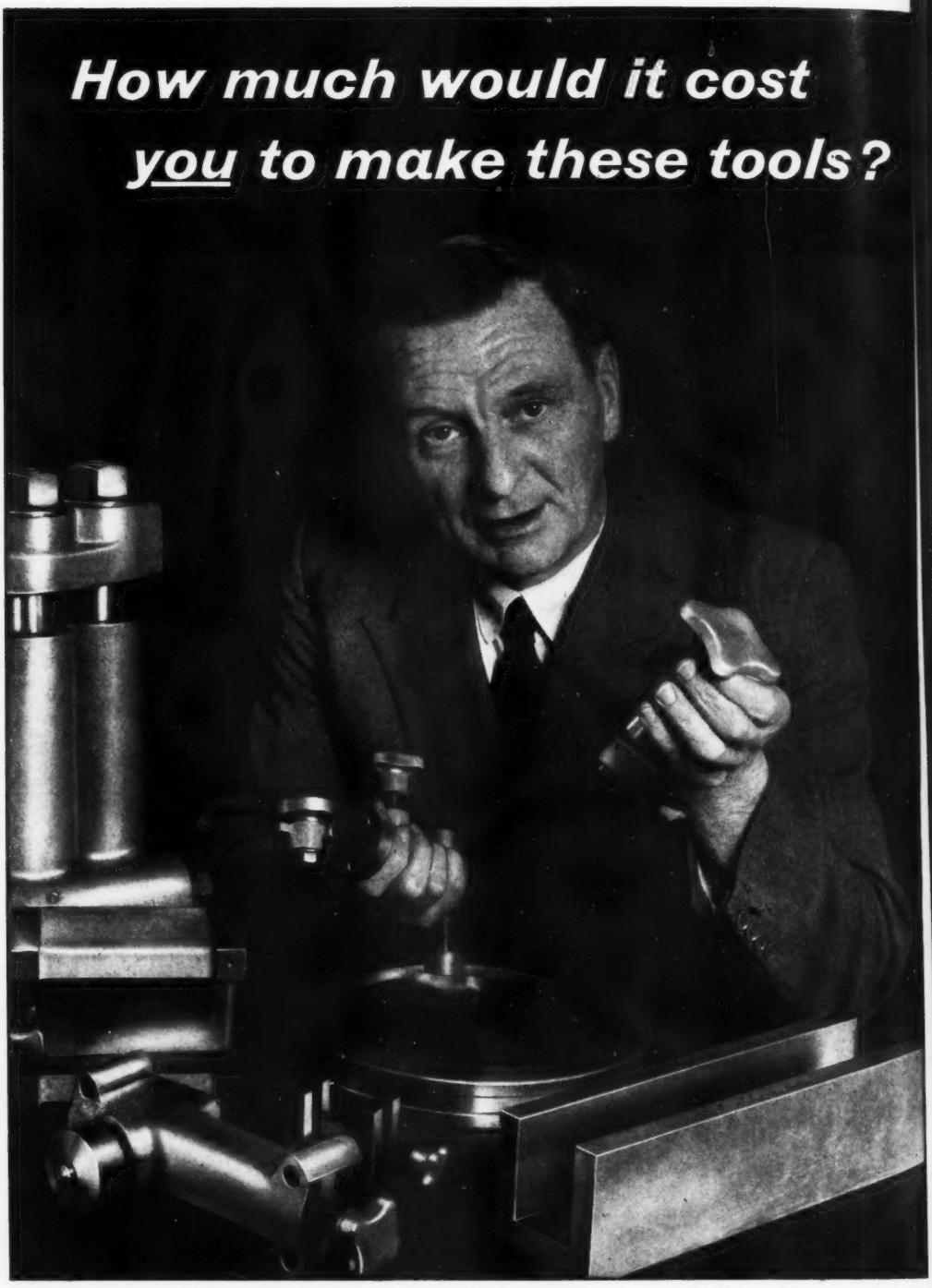


Write for full particulars to:

W. J. MEDDINGS LTD

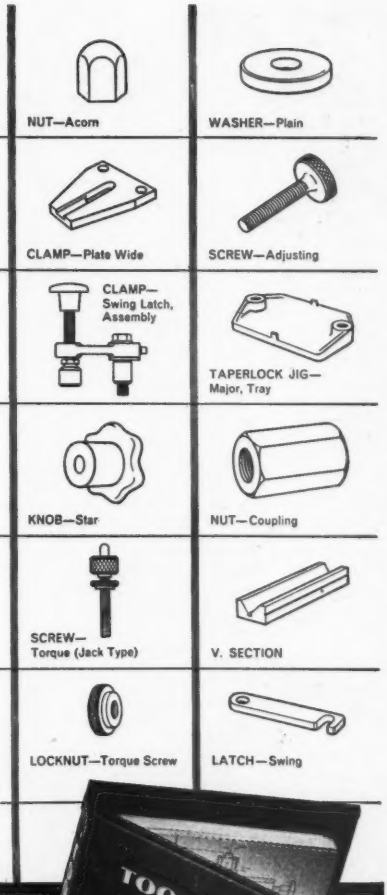
IPSWICH ROAD • TRADING ESTATE • SLOUGH • BUCKS

Telephone: Slough 25761 (5 lines)


How much would it cost
you to make these tools?

6, 196
?

...WE CAN SUPPLY THEM AT A FRACTION OF THE COST—within days!



Did you know that many of the jigs and tools prepared at great expense by your most skilled men can be assembled from high quality standard components supplied by Woodside? The fast-growing range already includes 30 basic tooling accessories in 300 individual forms, each available in numerous sizes. In today's competitive conditions, speed of re-tooling is often a decisive factor. Most WDS Tooling Aids are immediately obtainable from stock. The remainder can be supplied within days.

Tool up the Woodside way

SEND FOR THIS CATALOGUE OF TOOLING AIDS ▶

A glance through the list of standard items in the WDS Tooling Aids catalogue will show how you can cut costs and save time in the drawing office and at the bench.

THESE FIRMS FIND IT PAYS TO USE WDS TOOLING AIDS. *Aveling-Barford Limited (Grantham), Burco Limited (Burnley), The de Havilland Aircraft Company Limited, Dimplex Limited, The English Electric Company Limited, Fairey Aviation Limited, Fairey Engineering Limited, Ferodo Limited, Ferranti Ltd. (Hollinwood), Handley Page (Reading) Limited, Humber Limited, Jaguar Cars Limited, A. A. Jones and Shipman Limited, Morphy-Richards (Cray) Limited, The National Cash Register Company (Manufacturing) Limited, Peto Scott Electrical Instruments Limited, The Pyrene Company Limited, Simplex Electric Company Limited, Westland Aircraft Limited.*

THE BRITISH OXYGEN COMPANY LIMITED

WOODSIDE WORKS, NEWLAY, LEEDS 13 Tel: Horsforth 4251/5 Telegrams: Wooddie, Leeds. Telex 55185

TGA WOIC

When answering advertisements kindly mention MACHINERY.

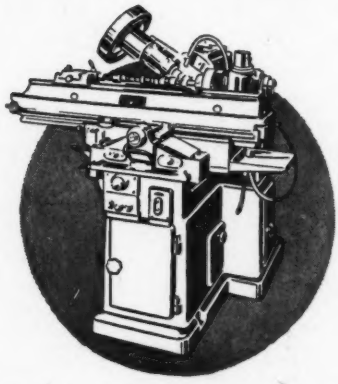
C2

For Long Splines

Taper or Parallel Serrations *plus* High Angle Spiral Gears

DOWDING

H.7 HORIZONTAL UNIVERSAL HOBBER



7th European Machine Tool Exhibition BRUSSELS

STAND 9105
HALL 9

Powerful and rigid. Suitable for climb or orthodox hobbing. Built-in differential for helicals. Heavy duty or high spiral angle hob heads. Taper hobbing attachment available which also permits combined plunge and axial feeds to be used for hobbing gears in between shoulders.

7" DIAMETER, 8 DP., 18" HOBBING LENGTH, 24" BETWEEN CENTRES, SPINDLE BORED 3" DIA.

DOWDING & DOLL LTD
346 KENSINGTON HIGH STREET, LONDON, W.14
Tel: WESTERN 8077 (8 lines) Telex: 23182 Grams: ACCURATOOL LONDON TELEX

Write for the fully illustrated brochure M/153

Now...
DRILLING-BORING -MILLING on *One* Versatile Machine

FRENCH

SAUT-DU-TARN

VERTICAL SLIDING HEAD DRILLING, BORING, TAPPING AND MILLING MACHINE MODEL J 6c 320

This multi-purpose machine has an extensive selection of speeds and feeds plus an unusually wide range of traverses. Fast approach and automatic return of the spindle head, plus quick-change tool sockets, permit rapid operation. The head slides smoothly on rollers. The 35½" x 14⅛" table has longitudinal and transverse automatic feeds, and when disengaged, the table floats freely on rollers for rapid hand positioning.

Capacities: 1¾" drilling, 4 11/16" boring in medium C. steel.
Spindle speeds (12) 80 to 2750 r.p.m. Spindle head traverse 19⅛".
Table traverses: 15¾" long., 9½" trans., 14½" vertical.

7th European Machine Tool Exhibition BRUSSELS

STAND 6016 HALL 7

Send for illustrated brochure M/189.

DOWDING & DOLL LTD

346 KENSINGTON HIGH STREET, LONDON, W.14

Tel: WESTERN 8077 (8 lines) *Telex:* 23182 *Grams:* ACCURATOOL LONDON TELEX

109 J

PARK GATE

QUALITY STEELS FOR BRIGHT DRAWING

1825 EXPERIENTIA DOCET 1961

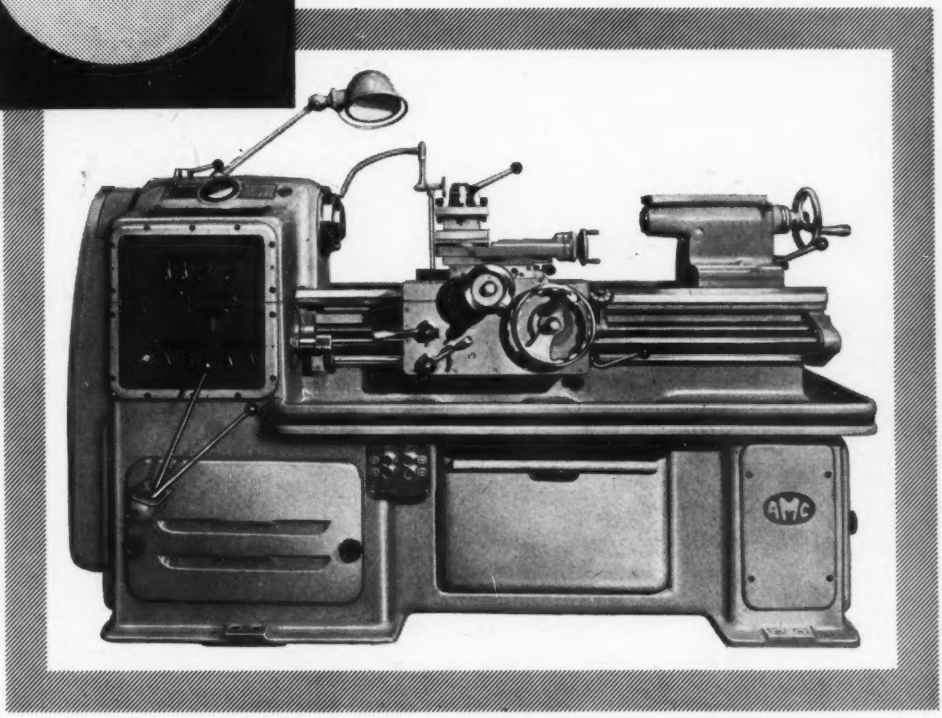
black bars
rolled
to close limits

THE PARK GATE IRON & STEEL COMPANY LIMITED ROTHERHAM
A Tube Investments Company TELEPHONE: ROTHERHAM 2141 (15 lines) TELEGRAMS: YORKSHIRE, PARKGATE, YORKS. TELEX 54141

When answering advertisements kindly mention ***MACHINERY.***

AMC

CENTRE LATHES FOR TOOLROOM AND PRODUCTION WORK



SPECIFICATION:

Centre height	7½"
Distance between centres	31½" or 49"
Swing over bed	16"
Swing over cross slide	8"
Swing in gap	18½"
Spindle speeds (22)	31 - 2,500 r.p.m.

EARLY DELIVERY

ELGAR EXCLUSIVE DISTRIBUTORS IN THE UNITED KINGDOM.

MACHINE TOOL COMPANY LIMITED

172-178 VICTORIA ROAD · ACTON · LONDON W3 · Telephone ACORN 5555

MIDLANDS SHOWROOM: 1075 KINGSBURY ROAD, ERDINGTON, BIRMINGHAM 24. Tel: Castle Bromwich 3781/2

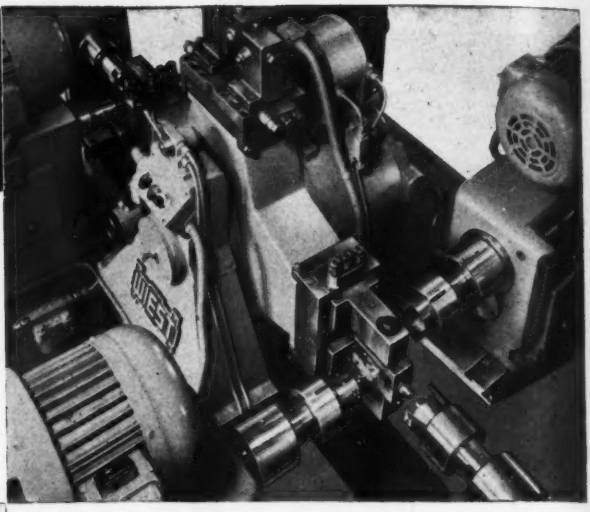
SOLE SCOTTISH AGENTS: ANGUS & CRICHTON (SALES) LTD., 7 MIDLAND STREET, GLASGOW C.1. TELEPHONE: CITY 4560

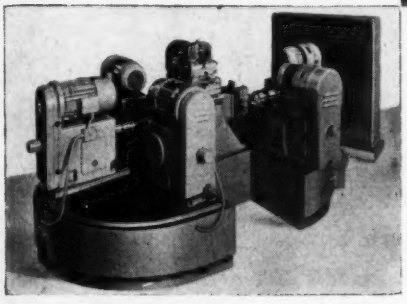
3532

WIEST

MULTI-SPINDLE INDEXING AUTOMATICS

3 MACHINING UNITS
3 THREADING UNITS
4 STATION DRUM





- DRUM SUPPORT BOTH SIDES
- INDEPENDENT ADJUSTMENT OF FEEDS AND SPEEDS ON ALL SPINDLES
- NO CAMS
- INTERCHANGEABLE FIXTURES
- SELF-CENTERING JAWS
- HEAVY QUILLS
- FULLY AUTOMATIC

See this machine at

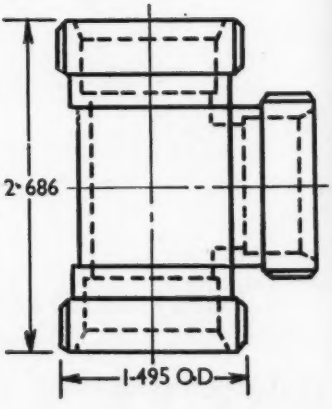
BRUSSELS

STAND No. 7031 HALL 7

machining this solid

1⅛" B.S.P. STAMPING

IN ONE PASS!



EMBASSY
FOR OUTSTANDING MACHINE TOOLS

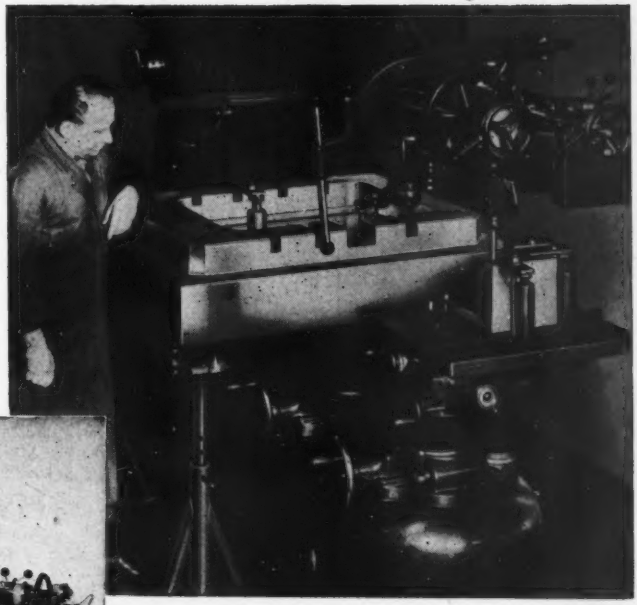
EMBASSY MACHINE & TOOL CO LTD

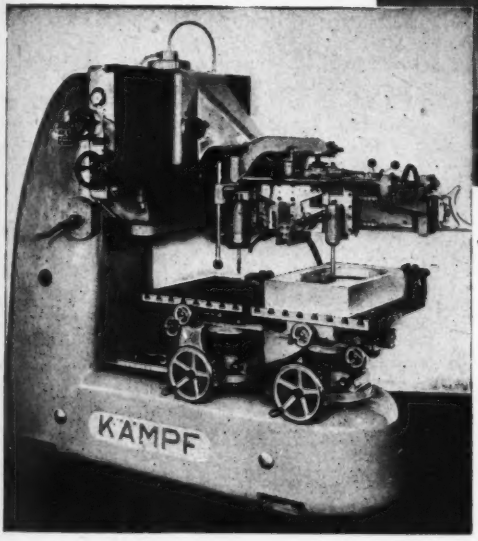
248 Watford Way : Hendon : London N.W.4
Telephone: **SUNnyhill 1321/2829**

* MOULDS KEEP ON GETTING BIGGER

KAMPF
MODEL FK3
THREE-DIMENSIONAL
DIE SINKING MACHINE

. . . ensures true three-dimensional scanning. Working area 28" x 36". Maximum die block height 20". Maximum dead weight on table 1½ tons. Outside supports, however, enable much heavier and bulky jobs to be easily tackled.





* Profile milling radii into a die, size 43" x 33½" x 14", weight 2½ tons. Material 70 ton tensile steel.

EARLY DELIVERY

EMBASSY MACHINE & TOOL CO. LTD.
TELEPHONE: SUNNYHILL 2829

248 WATFORD WAY, LONDON, N.W.4
TELEGRAMS: EMBATOL, LONDON

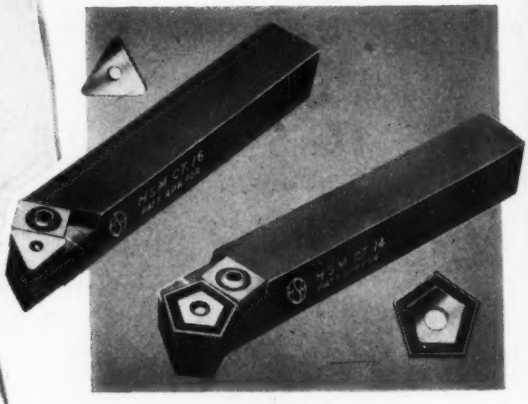
BRUSSELS EXHIBITION
September 3-12
Hall 9, Stand 9216

EMBASSY
FOR OUTSTANDING MACHINE TOOLS

When answering advertisements kindly mention MACHINERY.

Have YOU a tool grinding problem?...

Wejlock tools with Tungsten Carbide "throw-away" tips are the simple, effective answer. The tips have six or ten cutting edges and a worn edge may be changed in less than ten seconds. They entirely eliminate grinding and the need to reset after renewing a tool. If you have a cutting, pressing or excessive wear problem then our advice, based on over 25 years experience, is at your disposal.



Literature available on request.

Specify HSM TUNGSTEN CARBIDE BRAND

Tungsten Carbide Tips, Lathe tools, Milling Cutters, Special Cutters, Special Reamers, Special Drills.

HIGHER SPEED METALS LTD

BROCCO STREET, SHEFFIELD 3. TELEPHONE 20318

Machine Tools and Presses you must see at the **600**

7th EUROPEAN MACHINE TOOL EXHIBITION

BRUSSELS

3rd to 12th September, 1961

ATELIERS DEMOOR S.A. **HALL No. 4, STAND No. 4015**

Exhibits include:

Oil Field Lathe with Hydrominic Screwcutting; 9" Spindle Bore.
19¾" × 16' 5" Lathe with Electro Magnetic Copying.
Range of Centre Lathes and Self-contained Pneumatic Hammers.

ATELIERS MARCEL PEGARD S.A. **HALL No. 6, STAND No. 6203**

Exhibits include:

A.F.10 Jig Boring, Boring and Milling Machine. 100mm. spindle, with co-ordinate settings.
A.F.7 Jig Boring, Boring and Milling Machine. 70mm. spindle, with co-ordinate settings.
U.110.B.C. Cross Bed Universal Boring Machine. 110mm. spindle.

ATELIERS HUBERT RASKIN S.A. **HALL No. 8, STAND No. 8100**

Exhibits include:

200-ton, 75-ton and 22-ton Inclinable Presses.
75-ton Eccentric Press.
180-ton Double-Sided Single Crank Press.
1000-ton Knuckle Joint Press.

Our specialist technical representatives will be in attendance throughout the exhibition. We shall be pleased to arrange an appointment. Please contact us

Sole Agents in the United Kingdom:

THE 600 GROUP OF COMPANIES

GEORGE COHEN

SONS AND COMPANY LIMITED

23/25 Sunbeam Road
LONDON, N.W.10
Elgar 7222

Stanningley Works
Nr. LEEDS
Pudsey 2241

Bell Street
WEST BROMWICH
West Brom. 2634

600

See these at

7th EUROPEAN MACHINE

BRUSSELS, SEPT.

We draw your attention to the special features

HILGERS MASCHINEN-UND APPARATE BAUANSTALT M.B.H., GERMANY
HALL No. 8, STAND No. 8203
Exhibits include:

Model HY.38 Electric-hydraulic Semi-automatic Tube Cold Bending Machine, for tubes up to 38mm. o.d. with 2mm. wall thickness = approx. 1½" o.d. with ·08" wall thickness. In new design fitted with automatic hydraulic slide rail pressure device.

Model HDY.114.BD Electric Hydraulic, Semi-Automatic Tube Bending Machine in special design, equipped with automatic, hydraulic booster device synchronised to the running of the machine model HDY.114 on which we will bend tubes 70mm. o.d. with 5mm. wall thickness to a radius 1, 5 × D.

Model HYB.50.GVU Electric-hydraulic Automatic Tube Cold Bending Machine for tubes up to 50mm. o.d. with 2mm. wall thickness = approx. 2" o.d. with ·08" wall thickness. *i.e.* the Automatic Tube Cold Bending Machine fitted with: fully automatic combined positioning and angular turning-device, but *without* feeding device.

KOLLMANN MASCHINENBAU C.M.B.H., GERMANY
HALL No. 8, STAND No. 5309
Exhibits include:

Model MBVS.62 Plano Milling Machine, with 2 horizontal milling spindle heads type 1a/130 with 1 vertical milling spindle head type 1a/130 with a capacity of 18·5 kW each. Working surface of table 126" × 43½". Bed 275½" × 31½". Daylight between the columns 64½". Daylight between the horizontal spindle noses 35½"—55½". Daylight between table and lower edge vertical spindle nose 0—55½" with automatic programme control.

A.B. MALCUS HOLMQUIST, SWEDEN
HALL No. 7, STAND No. 7707
Exhibits include:

Model MC-50 Centreless Grinder with 50 H.P. main motor, together with the new automatic Bar Feed Table 306. On this machine bars with diameter about ½" and length about 10' are to be ground.

Model MC-50a Centreless Grinder arranged for automatic grinding of twist drills with taper shaft.

Model MC-35a Centreless Grinder.

Model MP-5 Surface Grinding Machine with hydraulic equipment.

Sole Agents in the United Kingdom:

The Selson Machine

SUNBEAM ROAD, LONDON, N.W.10
Telephone: ELGAR 4000

Selson MACHINE TOOLS

machines the 600 TOOL EXHIBITION

3rd to 12th 1961

incorporated in the Machine Tools listed below

J. MODLER, GERMANY
HALL No. 7, STAND No. 7016
Exhibits include:

Model MT.75 Special Centreless Production Grinder for special rollers. Model MRK.82 special continuous Production Grinder for the Convex ends of taper rollers. Model MN.78 special end Grinding Machine for bearing needles.
Model MS.79 special Double End Grinding Machine for highest quality requirements. Model MTS.400 special Ballworks Grinding Machine system (Grinding) Model MK.81-400 Ball Filing Grinding and Lapping Machine. Model MKS.89 Special Ball Sorting Machine.

PRAEHOMA-WERK KEHREN & CO., GERMANY
HALL No. 7, STAND No. 7602
Exhibits include:

Model RWS Compound Rotary Table Surface Grinding Machine. Table diameter 28". Model RW.6 Rotary Table Surface Grinding Machine with horizontal grinding spindle. Diameter of table 24".
Model L.10 Longitudinal Surface Table Grinding Machine. Grinding length 48". Clamping width 14". Wheelhead diameter 16".

R. STUHLMANN & CO., GERMANY
HALL No. 3, STAND No. 3309
Exhibits include:

Model NZ.250.S Internal Keyseating Machine, 10" stroke. Model NZ.320.S Internal Keyseating Machine, 12" stroke. Model NZH.100 Hydraulic Internal Keyseating Machines for 20", 26" and 31½" lengths of strokes.

U.V.A., SWEDEN
HALL No. 7, STAND No. 7603
Exhibits include:

Ready to discuss your problems on cold heading and thread rolling. (Machines not being shown).

G. VERNIER, FRANCE
HALL No. 6, STAND No. 6319
Exhibits include:

Model FV.3/S Combined Universal Vertical Milling Machine. Model 750 New Type Ramhead Milling Machine. Model 1059 Heavy Duty Ramhead Milling Machine. Model 1160 New Type Fixed Bed Swing-out Universal Head Milling Machine.

VOEST, AUSTRIA
HALL No. 4, STAND No. 4014
Exhibits include:

Automatic Lathes.

We look forward to meeting you. Our Technical Representatives will be present to give you all the information you require.

Tool Company Limited.

STANNINGLEY, Near LEEDS
Telephone: Pudsey 2241

BELL STREET, WEST BROMWICH
Telephone: West Brom. 2634

And at Kingsbury (Nr. Tamworth) Manchester, Glasgow, Swansea, Newcastle-on-Tyne, Sheffield, Southampton, Belfast, Bath.

THE 600 GROUP OF COMPANIES

MMT

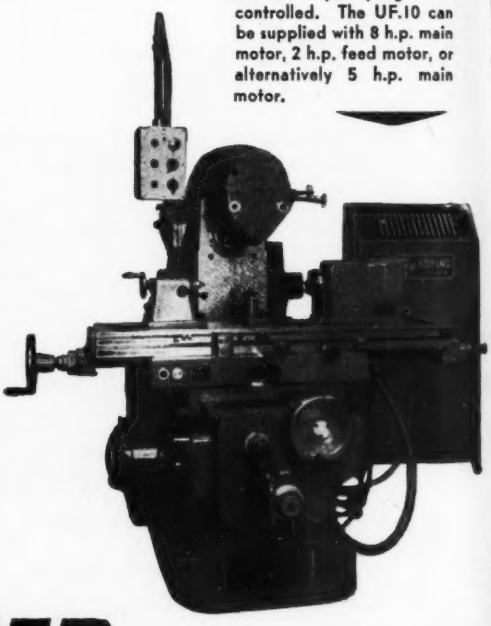
New VF.20 Vertical Milling Machine featuring the swivelling head with independent motor drive for power feed to quill, enabling power feed of quill to be obtained at any angle desired. This is a valuable feature especially in repetitive drilling and boring. Main spindle motor 15 h.p., feed motor 3½ h.p., special feed motor for spindle quill ½ h.p.

KÖPING

MILLING MACHINES

Lead the Field!

The UF.10 illustrated with automatic cycle programme control including rise and fall of knee and indexing. All machines supplied with double front support to knee giving maximum support under the heaviest cut. Range includes universal, plain, vertical, auto-cycle and auto-cycle programme controlled. The UF.10 can be supplied with 8 h.p. main motor, 2 h.p. feed motor, or alternatively 5 h.p. main motor.



Also world-renowned manufacturers of high precision heavy duty lathes, 45 models from 8" height of centres to 20" height of centres, 40" between centres to 120" between centres. Larger machines manufactured to special requirements.

NRP5081

MORTIMER

EXCLUSIVE DISTRIBUTORS OF THE FINEST MACHINE TOOLS

MORTIMER MACHINE TOOL CO. LTD · MORTIMER HOUSE · ACTON LANE · LONDON NW10 · Tel: ELGar 3834-5-6

Talk to Sykes about the V10B

41 gears in 59 minutes

V10B

. . . you would probably be quite satisfied if you produced these 41 gears in the time stated. With the V10B Vertical Gear Generator (Basic model) we promise you more than that . . . you can set the machine, size the first gear and cut the remainder of the batch . . . in less than an hour.

If you would like to know more about the remarkable savings which the V10B can effect on setting and cutting times on batch production write for a copy of brochure P18/60.

7th European Machine Tool Exhibition
Brussels, September 3rd—12th, Stand No. 5111, Hall 5

22 teeth, 16 D.P. 13/16 in. face width, E.N.8. Steel.

SYKES

W. E. SYKES LIMITED · STAINES · MIDDLESEX · ENGLAND

and associated companies:

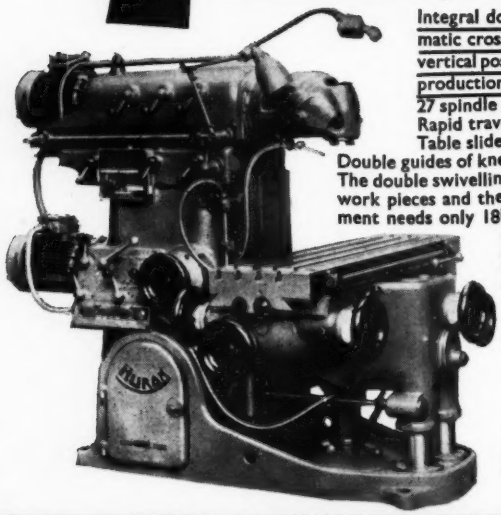
Sykes Tool Corporation Ltd., Windsor, Ontario, Canada. Sykes Machine & Gear Corporation, Detroit, Michigan, U.S.A. W. E. Sykes Ltd., Mascot, Sydney, NSW, Australia.

SLIDING RAM GIVES 27½in. AUTO CROSS FEED

HEAVY DUTY MILLING

ANGULAR COMPOUND HORIZONTAL VERTICAL

HURON SUPER UNIVERSAL MILLERS



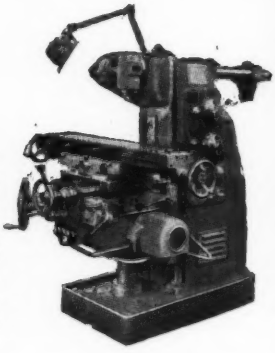
Integral double swivelling universal head provided with 27½in. automatic cross feed by the sliding ram, can be set to the horizontal or vertical position, or to any angle instantaneously—permits the heaviest production cuts. Heads can be retracted completely from table line. 27 spindle speeds from 30 to 2,066 r.p.m., 27 feeds from ½in. to 30in. Rapid traverses in all directions. All operating controls duplicated. Table slides directly in the knee without cross movement or swivel. Double guides of knee permit components in excess of 1½ tons to be machined. The double swivelling universal head requires an opening of only 14in. to enter work pieces and the whole sliding ram with its 27½in. automatic cross movement needs only 18in. clearance. OPTIONAL EXTRA FEATURES: Mounted spacing casting assemblies providing additional 8in. capacity under spindle. 26in. wide 8 T-slot tables and 39½in. automatic cross feed of sliding ram with special heavy duty knee and front operating position.

Type	Table	Automatic Feeds Long	Cross	Vert.
KU4	56½in. × 15½in.	43½in.	27½in.	19½in.
KU5	64½in. × 15½in.	51½in.	27½in.	19½in.
KU6	78½in. × 16½in.	59in.	27½in.	19½in.
KU55	64½in. × 26in.	51½in.	38½in.	18½in.
L83	157in. × 59in.	118in.	39½in.	59in.

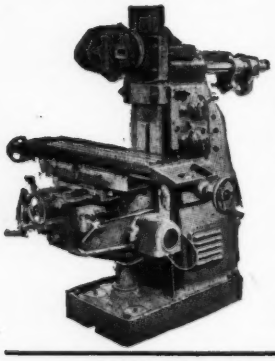
Type 'L' Open-side Traversing Head Universal Miller will mill, bore, slot and drill the largest work-pieces at one setting. The unique design permits greatest variety of operation on large work-pieces; the component remains stationary on the large work-table. Upright slides full length of base table and the sliding ram moves vertically and horizontally.

DUFOUR UNIVERSAL MILLERS

WITH DOUBLE UNIVERSAL SWIVELLING HEAD. RETRACTABLE SLIDE BRACKET AND SPACING CASTING GIVING 26" DAYLIGHT ON No. 59 AND 21" ON No. 61



FOR ALL MODELS Direct reading dial change for speeds and feeds. All parts subject to wear hardened and ground and completely interchangeable. Built to closest tolerances. Rapid traverses in all directions. Table swivels 30°. No. 40 taper for main horizontal spindle, double swivelling universal head, dividing head and rotary table. Hardened and ground centre guide for slideways. Twin overarms. Double swivelling sliding spindle heads with speeds 53-3000 r.p.m. Double swivelling universal head on retractable slide bracket providing with 5½in. Spacing Casting Drive assembly on 59 Machine 26in. daylight, and 21in. on No. 61.



MODELS 53 & 61. 16 universal head spindle speeds. 21-1600 r.p.m.; 8 horizontal spindle speeds 21-1180 r.p.m.; 8 automatic feeds ½-18½in

MODEL 59. 36 universal head spindle speeds 14-1780 r.p.m.; 12 horizontal spindle speeds 21-1180 r.p.m.; 16 automatic feeds ½-20in.

MODEL 54. Automatic cross feed of universal head 20in.; 18 universal head spindle speeds 12-1500 r.p.m.; 36 horizontal spindle speeds 6-1500 r.p.m.; 18 automatic feeds ½-23½in.

Type	Table	Automatic Feeds Long.	Cross	Vert.
53	43½in. × 9½in.	27½in.	9½in.	15½in.
61	47½in. × 10½in.	30½in.	9½in.	15½in.
59	51½in. × 11½in.	34½in.	11½in.	21½in.
54	67in. × 14½in.	43½in.	14½in.	20½in.

EUROPEAN MACHINE TOOL EXHIBITION, BRUSSELS
SEPTEMBER 3—12, 1961

We look forward to demonstrating these machines to you on STAND 9119, Hall 9; and STAND 6119, Hall 6

Send for full particulars of our very extensive range of these machines; ask for demonstration

Rudolph Carne & Co. Ltd. SWAN WORKS, FISHERS LANE, CHISWICK, LONDON, W.4.

Tel. CHISWICK 0514, 6585 & 0337 Inland Telegrams RUDCAR, CHISK, LONDON Overseas Telegrams RUDCAR, LONDON W.4

Confidence in

MATRIX QUALITY

MATRIX No. 50 Optical Jig Borer

Manufactured by the Coventry Gauge & Tool Company Limited.

The above illustration shows one of our Machines as supplied to **The National Physical Laboratory** and **The National Engineering Laboratory.** Our confidence that there exists no finer example of High Precision Engineering than that embodied in the 'MATRIX' No. 50 Optical Jig Borer is confirmed by increased sales and by the large number of distinguished customers who have selected our machine for their most exacting requirements.

TABLE SIZES
24" x 36" and also now available in 24" x 42"

ROCKWELL
MACHINE TOOL CO. LTD.

For further particulars write or telephone TODAY

WELSH HARP, EDGWARE RD., LONDON, N.W.2. TEL: GLADSTONE 0033

ALSO AT BIRMINGHAM—TEL: SPRINGFIELD 1134/5 · STOCKPORT—TEL: STOCKPORT 5241 · GLASGOW—TEL: MERRYLEE 2822

Matrix 4

COLD HOBBING PRESSES

BY SACK & KIESSELBACH

SEVERAL SIZES from 100—3,000 TONS CAPACITY
MASSIVE CAST STEEL BODY
PATENT SWIVELLING CLEAR-VIEW GUARD
CAN BE USED with DEPTH or PRESSURE LIMITING DEVICE
BUILT FOR THE JOB

Note depth measuring device, automatically stopping machine when required depth has been reached.

SACK & KIESSELBACH have for many years been building Cold Hobbing Presses. These machines are therefore not adaptations but are designed and built for this work only. Their sound, robust basic design, high quality workmanship plus several special features found only on these machines greatly facilitates the production of sound moulds. Further details on request.

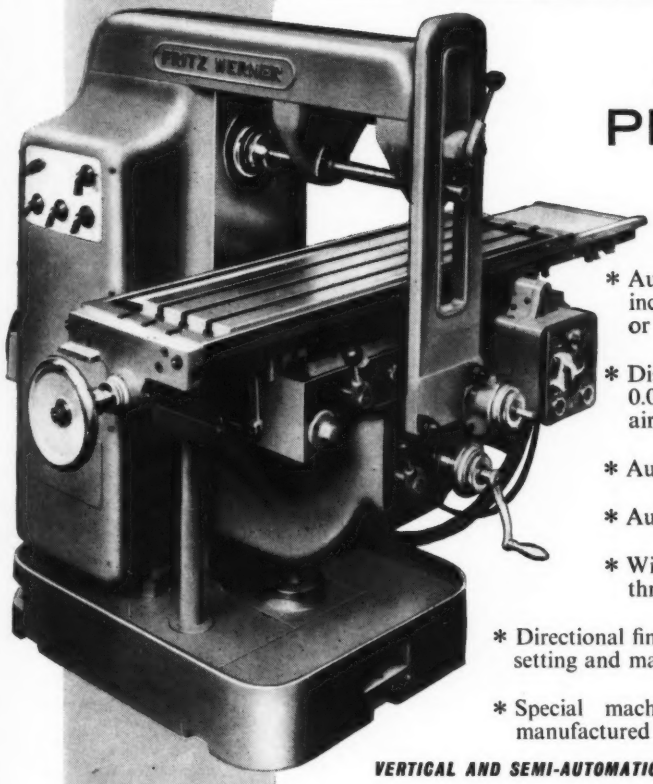
ROCKWELL
MACHINE TOOL CO. LTD.

WELSH HARP, EDGWARE ROAD, LONDON, N.W.2. TEL: GLADSTONE 0033

ALSO AT • BIRMINGHAM - TELEPHONE SPRINGFIELD 1134/5 • STOCKPORT - TELEPHONE STOCKPORT 5241 • GLASGOW - TELEPHONE MERRYLEE 2822

SK1

WERNER



AUTOMATIC PRODUCTION MILLERS

* Automatic cycles to left and right include automatic indexing of vertical or horizontal dividing attachments.
* Disengagement of rapid traverse with 0.040″ repeatability — less time 'cutting air'.
* Automatic spindle brake and reversal.
* Automatic cutter relief (optional).
* Wide ranges of speeds and feeds through pick-off gears.
* Directional finger tip switches control traverses for setting and manual operation.
* Special machines with additional movements manufactured to suit individual requirements.

VERTICAL AND SEMI-AUTOMATIC MACHINES ALSO AVAILABLE

BRIEF SPECIFICATIONS

MODEL	5101	9101	9103
Table size	28″ x 9″	36″ x 12″	50″ or 55″ x 14″
Automatic longitudinal traverse	16″	20″	27½″ or 31½″
Transverse adjustment	5½″	5½″	6½″
Vertical adjustment	14″	14″	14
Total horsepower	3 or 4 h.p.	4 h.p.	7 or 9 h.p.

ROCKWELL
MACHINE TOOL CO. LTD.

For further particulars write or telephone TODAY

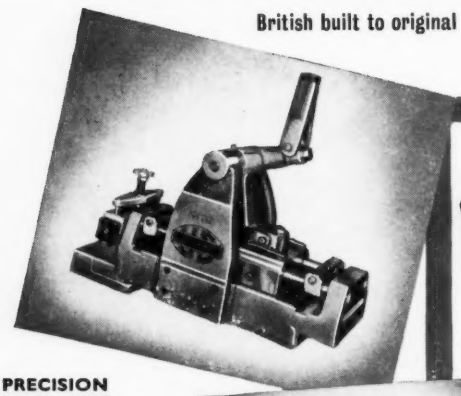
WELSH HARP, EDGWARE RD., LONDON, N.W.2. TEL: GLADSTONE 0033

ALSO AT BIRMINGHAM—TEL: SPRINGFIELD 1134/5 • STOCKPORT—TEL: STOCKPORT 5241 • GLASGOW—TEL: MERRYLEE 2822

Every Press Shop deserves the Best in

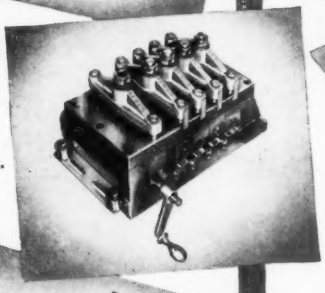
COIL HANDLING Equipment

British built to original U.S. Tool Co. design



PRECISION SLIDE FEED
Operated by press drive shaft. Easy change of feed length without connecting rod adjustment. Two sizes for material up to 6″ or 9″ wide by ⅛″ thick.

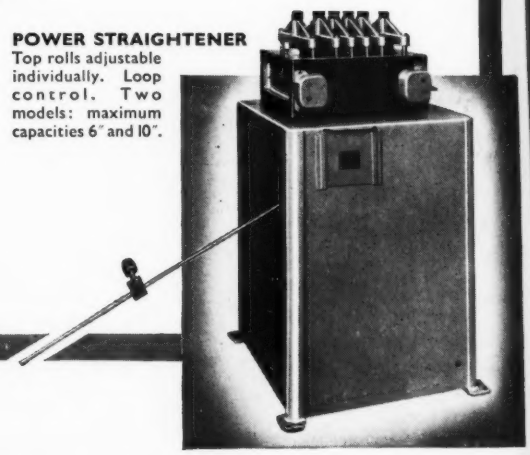
MULTI-ROLL ECONOMY CRADLE
Easy and rapid loading of coils up to 9″ wide, either by hand or overhead crane. Power driven take-out rolls synchronized with coil rest rollers.



PLAIN STOCK STRAIGHTENER
For use with slide feeds.

AUTOMATIC STOCK REEL
Easily loaded. Loop control. Equally suitable for feeding or rewinding scrap. Horizontal and plain models available.

POWER STRAIGHTENER
Top rolls adjustable individually. Loop control. Two models: maximum capacities 6″ and 10″.



For further particulars write or telephone TODAY

ROCKWELL
MACHINE TOOL CO. LTD.

WELSH HARP, EDGWARE RD., LONDON, N.W.2. TEL: GLADSTONE 0033

ALSO AT BIRMINGHAM—TEL: SPRINGFIELD 1134/5 • STOCKPORT—TEL: STOCKPORT 5241 • GLASGOW—TEL: MERRYLEE 2822

PR 17

6, 1961

ent

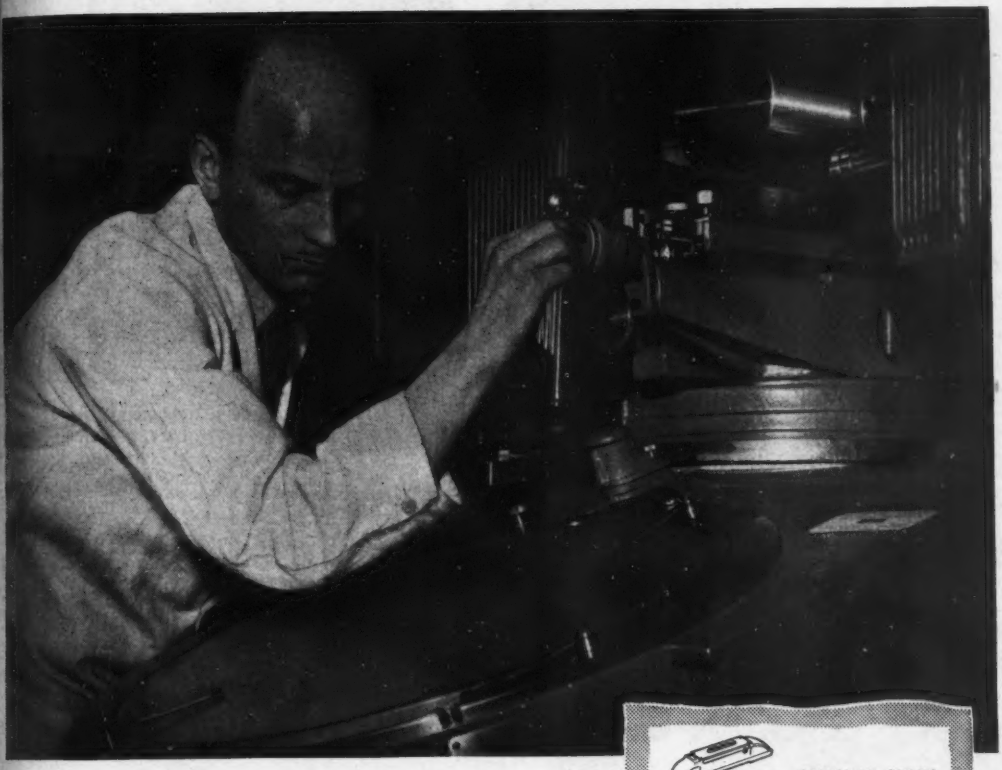
ULTI-ROLL
Y CRADLE
ding of coils
er by hand or
ower driven
ronized with

DSTONE 0033

ERRYLEE 2822

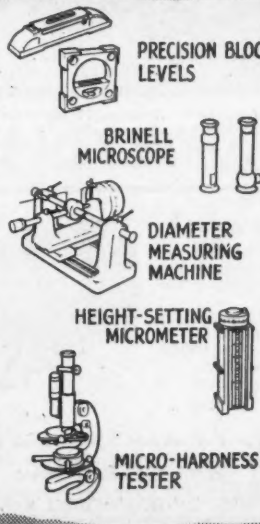
PR 17

INSPECTION – *the foundation of quality*



Our Measuring Department is a permanent exhibition of modern measuring and inspection equipment and constitutes the best-equipped A.I.D. approved Gauge Test House in the country. Instruments and machines can be demonstrated, problems can be discussed with experts and many standard instruments, such as those illustrated, can be supplied from stock.
As agents for Sigma, Hilger & Watts, Coventry Gauge, Pitter Gauge and Tool, Avery and others, we offer the most comprehensive metrology service in this country.

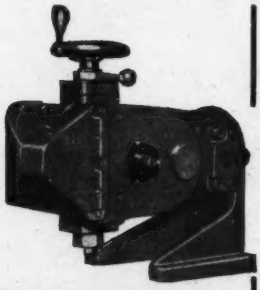
Send for a copy of our general measuring catalogue, over 150 instruments illustrated.



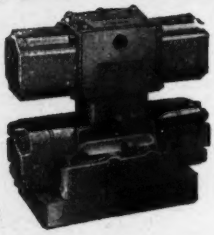
ALFRED HERBERT LTD., COVENTRY

AD 637

VARIABLE VOLUME AXIAL PISTON PUMPS.
Available in 7 series—fixed displacement pumps also supplied. In volumes up to 97.25 g.p.m.
Pressures to 5,000 p.s.i.
Available with 6 different types of control:—manual, mechanical, pressure compensating, hydraulic cylinder, servo and electrical.



DENISON PUMP/MOTOR VANE PUMPS.
68 g.p.m. 2,000 p.s.i.
Speeds to 1,800 r.p.m.
No alteration to convert pump to motor.
4 different porting combinations.



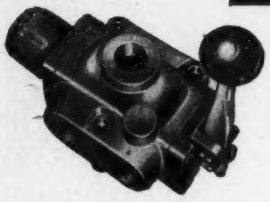
¾" 4-WAY DIRECTIONAL CONTROL VALVES.
3,000 and 5,000 p.s.i.
Electrically controlled and hydraulically operated. Max. volume capacity 25 g.p.m.

A SELECTION FROM THE RANGE OF

Denison DERI Limited

Hydr OIL ic EQUIPMENT

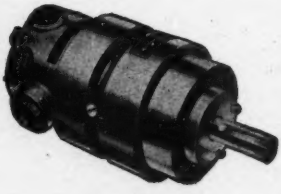
PRESSURE CONTROL VALVES (RELIEF TYPE).
¾", 1¼" and 1½" to 5,000 p.s.i.
Ensure extreme accuracy of pressure regulation over a wide pressure range.

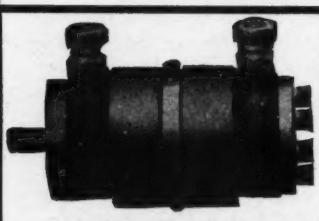


¾" 4-WAY DIRECTIONAL CONTROL VALVES.
Manually operated threaded body valves—detent positioned or spring positioned.
2,500 p.s.i. 9 spool types.
Subplate models available for 5,000 p.s.i.

MULTI-RANGE FLOW CONTROL VALVES.
¼", ⅜" and ½" to 3,000 p.s.i.
Each size and model provides 6 different flow ranges.

DERI SINE PUMPS.
A rotary positive displacement pump of high volumetric and overall efficiency.
Working pressures up to 2,500 p.s.i.
Intermittent pressures to 3,000 p.s.i.





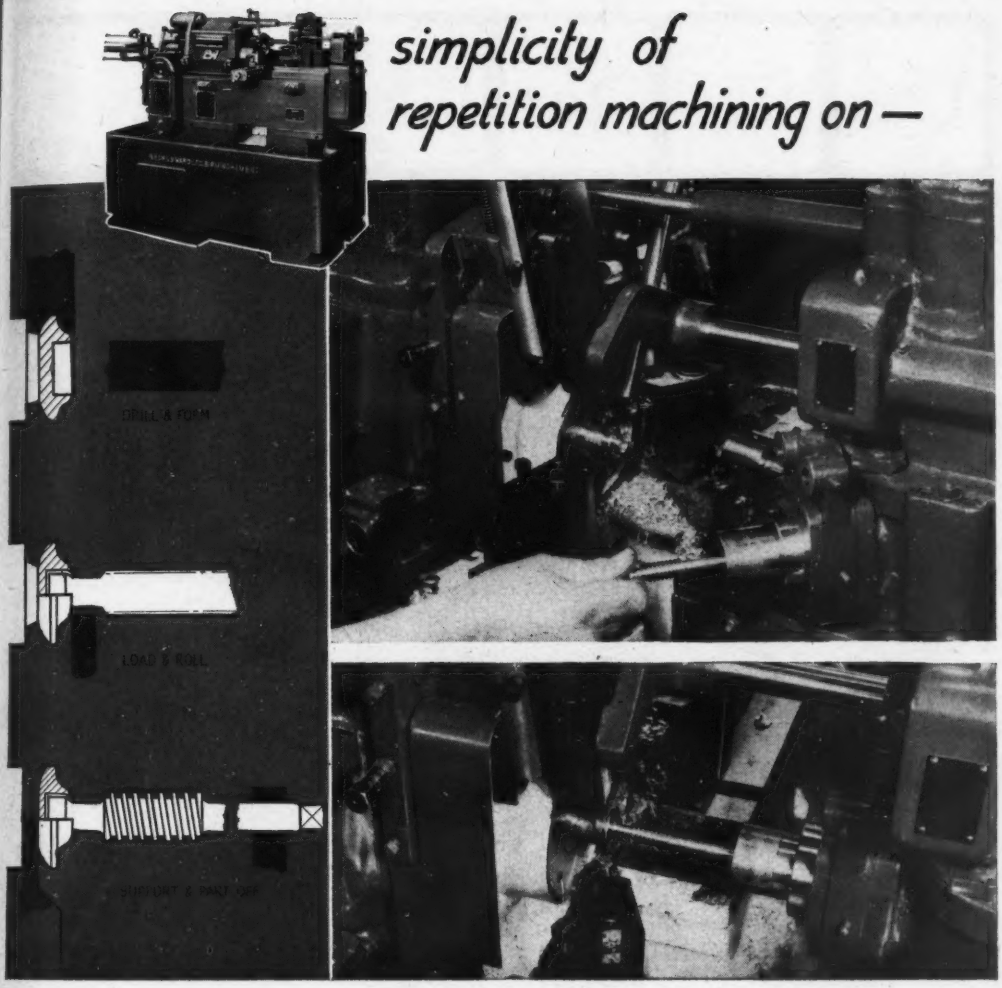
DERI SINE MOTORS.
Compact and robust machines of great flexibility.
Outputs to 100 h.p.
Rated up to 3,000 p.s.i.

★ *This selection is but a small part of the vast range offered to users of modern hydraulic equipment.*

A most comprehensive Technical Service assures complete satisfaction. Our engineers will be pleased to call and advise on any applications or problems of hydraulic power.
Write NOW for full information to:—

DENISON DERI LIMITED, VICTORIA GARDENS, BURGESS HILL, SUSSEX. TELEPHONE: BURGESS HILL 2640 & 2519

simplicity of repetition machining on—



A Brown & Ward 1¼in. 4-Operation Bar Automatic produces brass clack valves at the rate of 3.6 components per minute.

After the forming and drilling, the machined stem is loaded into the loading head on the turret and inserted in the valve body.

The wall of the valve head is peened over the edge of the stem, prior to parting-off.

BROWN & WARD
single-spindle BAR AUTOMATICS

Uses simple standard cams and tools.

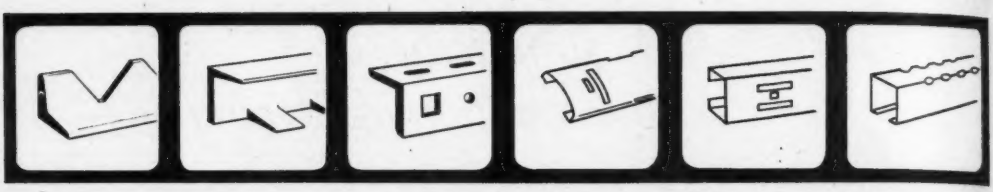
Wide range of attachments increases versatility.

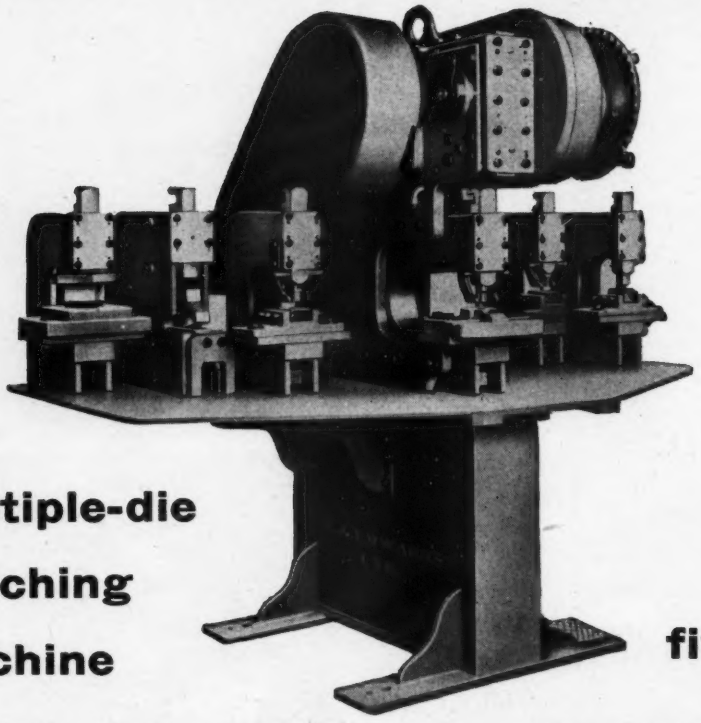
Competitive to six-station machines relative to low capital outlay.

Six sizes, three types, for work up to 1½" dia. x 4½" long.

ALFRED HERBERT LTD., COVENTRY Factored Division, Red Lane Works.

AD 638





multiple-die punching machine

five sizes

with really speedy tool change

35 to 100 tons capacity

Each machine takes interchangeable tool heads already set up with tools for punching, square or mitre notching, shearing flat, round, square or sectional material or special tools to suit the operations in a specific industry such as steel window manufacturing or the variable work of structural engineering and metal fabricating.

The heads, already set up with their particular tools, are most easily and quickly changed to suit the job required. Special feed equipment, supporting tables and precision length stops can be supplied.

Set your own pace . . . with one machine and any number of interchangeable tool heads or any number of machines each with a head for different operations . . . suit your own production. All-steel construction, throat depths from 7¾ in. to 13¾ in. Let us send you fuller details or quote you for a set-up to produce your job.

F.J. Edwards Ltd

Edwards House, 359-361 Euston Road, London, N.W.1.
Phones: EUSton 5000 Telex 24264 Grams: Bescotools London NW1
Lansdowne House, 41 Water Street, Birmingham, 3
Phones: CENtral 7606/8 Grams: Bescotools Birmingham 3

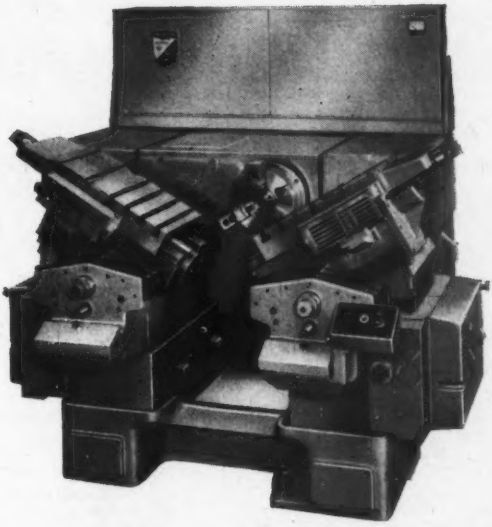
FRONTOR

Front-operated multi-tool chucking lathes

The latest development of a remarkably efficient lathe design: Ideally suited to small, medium or large batch production the FRONTOR machines offer marked advantages in both setting and operating and require a minimum of floor area.

Available with

- Semi-auto cycle
- Transfer equipment
- Constant feed facing
- Auto-cycle with magazine feed
- Copying attachments
- Automatic chip disposal



FRONTOR machines are a joint development of two leading German machine tool manufacturers:

J. G. Weisser Söhne

FRONTOR 25

Nominal turning diameter: 9¾ in.

Maschinenfabrik Diedesheim

FRONTOR 40

Nominal turning diameter: 15¾ in.

Write for full details

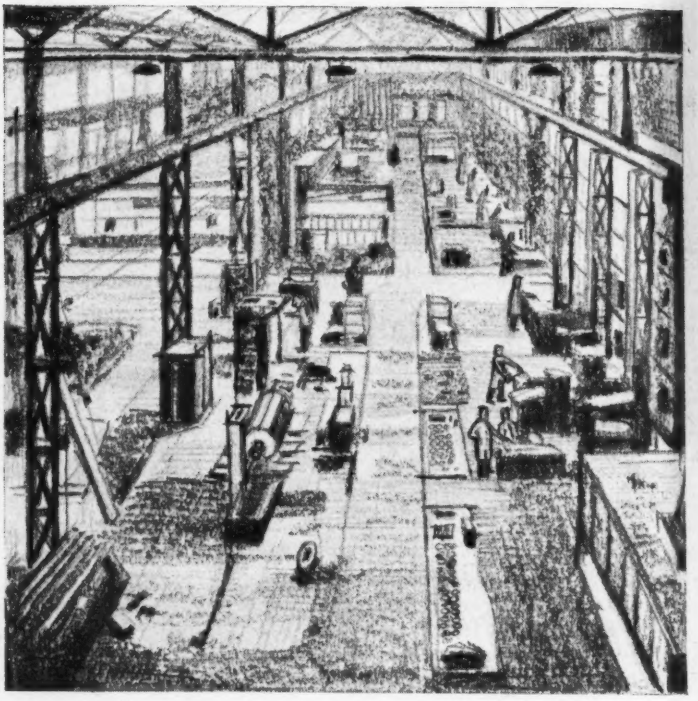
SOLE BRITISH AGENTS

SYKES MACHINE TOOL COMPANY LIMITED

Hythe Works, The Hythe, Staines, Middlesex. *Telephone* Staines 55474 (5 lines) *Telegrams* Sytool Staines

OVER 300 ACRES OF PLANT...

AT YOUR SERVICE



Let's say you have a special job to do, and you doubt if it will pay you to tool up specially for it. Then you call in the Carron technical advisory service. We are used to this sort of problem. Through us you can use Carron's vast plant capacity for components. We have at our disposal 300 acres of plant for casting, forging, machining, enamelling, and sheet metal fabrication. We can give you a quote. Then we do the job for you. Quickly and efficiently.

For medium heavy engineering—

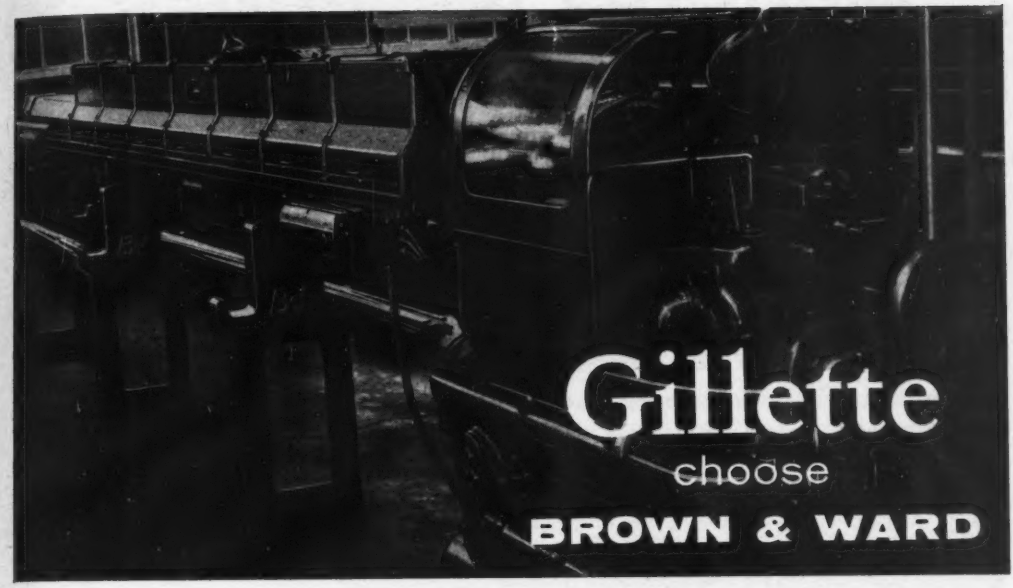
the following capacity is also at your service: planing vertical and horizontal boring mills; milling and drilling work up to 5 tons; moulding and machining capacity for non-ferrous components up to 5 cwts; including high speed routing and precision milling. Fabrications too, light and heavy gauge stainless steel, press tools, welding. For small light gauge sheet metal to large plate welded fabrications, Carron can quote.

CARRON

CARRON COMPANY · CARRON · FALKIRK · SCOTLAND

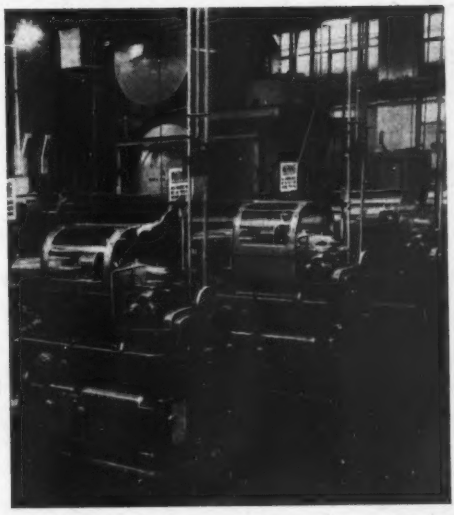
Telephone: Falkirk 35
London: 15 Upper Thames Street, E.C.4. Telephone: CENtral 7581
Liverpool: 22-26 Redcross Street, 1. Telephone: CENtral 1945
Glasgow: 125 Buchanan Street, C.1. Telephone: CENtral 8226
Newcastle upon Tyne: 33 Bath Lane, 1. Telephone: 26940

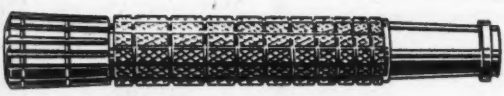
When answering advertisements kindly mention MACHINERY.



AUTOMATIC BAR FEEDS

To boost the production of component parts for their products to meet an ever-increasing demand, Gillette Razor Company have equipped this battery of Index Automatic Machines with BROWN & WARD AUTOMATIC MAGAZINE BAR FEEDS. Substantial increases have now been obtained, justifying beyond all doubt the confidence that Gillette placed in this equipment which is designed and manufactured to ensure reliability and maximum productive efficiency.
For further information on Automatic Bar Loading the Brown & Ward way, write for details to the address below.





Automatic Bar Machines and Magazine Bar Feeders

BROWN & WARD (TOOLS) LTD.

Leamore Lane, Walsall. Telephone Bloxwich 76846 W & W

When answering advertisements kindly mention MACHINERY.

INDUSTRY WELCOMES THE NEW TECALEMIT RIBBON FILTER ELEMENTS

Setting a fresh standard of high efficiency filtration for

AIR—WATER—PETROL DIESEL AND FUEL OILS | LUBRICATING, HYDRAULIC AND OTHER FLUIDS

Chosen for the famous FISHER Small Volume Regulators

Tecalemit Ribbon Filter Element is used in the series 67 combination Filter Regulator, manufactured by Fisher Governor Company Limited of Rochester. In such an application, the paper ribbon filter allows air to flow freely and provide adequate filtration, and water separation. A Tecalemit ribbon filter is sufficiently robust to withstand pressure drops well in excess of normal working conditions.

Tecalemit Ribbon Filter Elements

Simple construction—Low cost—High flow rate—Easy to clean

The elements are formed to resin impregnated cellulose ribbon, wound helically and electrically fused into an open-ended cylinder. Innumerable microscopic orifices between the ribbons allow a very high flow rate, while retaining impurities on the outside or inside surfaces, according to direction of flow.

The standard range of diameters (in any length) covers most applications and no other filtration material can so readily be adapted to individual requirements for filters, strainers, breathers or separators. Never before has such fine filtration been possible at such low cost and with such flexibility in use.

Tecalemit Ribbon Elements filter to maximum purity

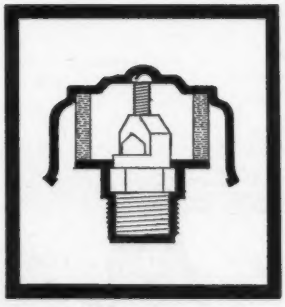
Tecalemit Air Breather Filters

(Incorporating Tecalemit Ribbon Filter Elements)

Cheapest—most efficient—cleanest to service Tecalemit Breathers act as ventilators to provide a free flow of clean air to hydraulic fluid, fuel and oil reservoirs. They give positive protection from airborne contamination to tanks, pumps, valves, cylinder and other engine components.

Of the standard types, two are breathers with screwed bodies, and the third is a combined clip-on assembly of breather and filter cap. All are fitted with Tecalemit Ribbon Filter Elements.

Tecalemit Breathers provide pure air cheaply and efficiently



TECALEMIT the authority on filtration

TECALEMIT LIMITED · (SALES M) · PLYMOUTH · DEVON

T733

When answering advertisements kindly mention MACHINERY.

ELLIOTT No. 5

with 15° TILTING WHEELHEAD

The new Elliott No. 5 has skill built into it; the operator needs very little experience to produce fine work right away, cutting out trial and error.
Duplicated controls cut time still further —and look at the features!

ELLIOTT
No. 5

TOOL AND CUTTER GRINDER

FEATURES THAT MATTER

- **Absolute simplicity of operation.**
  Immediate set-up of complicated workpieces.
- **Theoretically correct backing off irrespective of diameter.**
- **Self-contained stator and rotor spindle unit.**
- **Two speeds — without belt change.**
- **Maximum operating economy.**

PLEASE WRITE FOR 44-PAGE MACHINE TOOL CATALOGUE

Manufactured by:

B. ELLIOTT (MACHINERY) LTD

(MEMBER of the B. ELLIOTT GROUP)
VICTORIA WORKS · WILLESDEN · LONDON · N.W.10
Tel: ELGAR 4050 (14 lines) Grams: Elliottona, Harles, London
Overseas Subsidiaries CANADA · U.S.A. · AUSTRALIA · S. AFRICA

ELLIOTT OF LONDON GROUP

NRP 1871

Pipe-jointing

STRONG WATERTIGHT JOINTS

IN THE MINIMUM OF TIME*

*
Within a few hours drains can be smoke-tested or water-tested and trenches filled in.

No other type of cement gives such
SOUND AND SPEEDY RESULTS

CIMENT FONDU
Regd Trade Mark
ALUMINOUS CEMENT

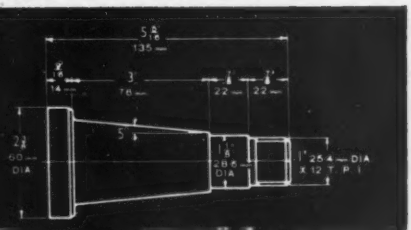
The Cement for Industry

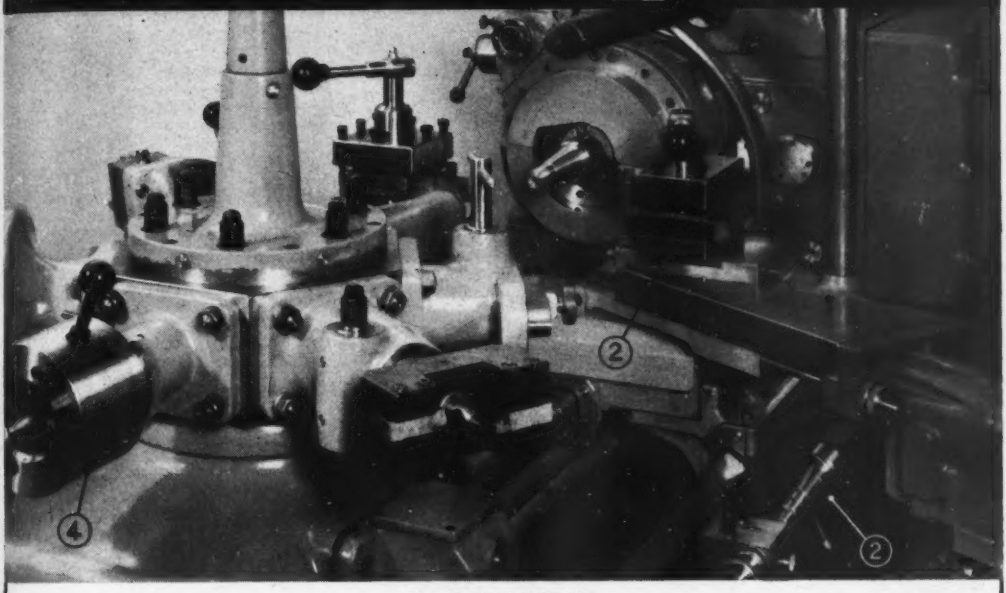
LAFARGE ALUMINOUS CEMENT CO. LTD., 73 BROOK STREET, W.1.
TEL: MAYfair 8546

AP/80

Ward SPECIAL

TOOLING LAYOUT No. 16





AXLE SHAFT

2½" dia. 25 ton Tensile Steel E.N.I.A. Tungsten Carbide Cutting Tools.

No. 7 PRELECTOR TURRET LATHE

Code Word : **Covetable**

Fitted with 2½" Air Bar Chuck and Hydraulic Copy Turning Attachment.

Floor to Floor Time : 4 mins. 20 secs.

DESCRIPTION OF OPERATION	Tool Position		Spindle Speed R.P.M.	Max. Cutting Speed		Feed	
	Hex. Turret	Cross-slide		Feet per min.	Metres per min.	Cuts per inch	m/m. per rev.
1. Feed bar to stop, close chuck & centre drill	1	—	1000	—	—	Hand	Hand
2. Support end of bar with live centre	2	—	—	—	—	—	—
Copy turn 1st. cut 7/16" deep × 4¾" long	—	Rear	1000	654	200	104	·244
" " 2nd. " ¼" " × 3¾" "	—	"	1000	392	119	104	·244
" " 3rd. " 1/16" " × 5⅝" "	—	"	1000	654	200	104	·244
3. Roller end & chamfer	3	—	1000	260	79·5	Hand	Hand
4. Screw with diehead 1" dia. × 12 t.p.i.	4	—	70	18	5·5	—	—
5. Part off	—	Front	1000	654	200	Hand	Hand

'PRELECTOR' Combination Turret Lathes with Preselective speed-changing.

TURRET LATHES with capacities up to 35 in. swing over bed

1¼ in. to 2¼ in. 'D-S' DOUBLE-SLIDE' Capstan Lathes for heavier accurate work.

Stock Tools, Toolholders, Chucks and Accessories for Capstan and Turret Lathes.

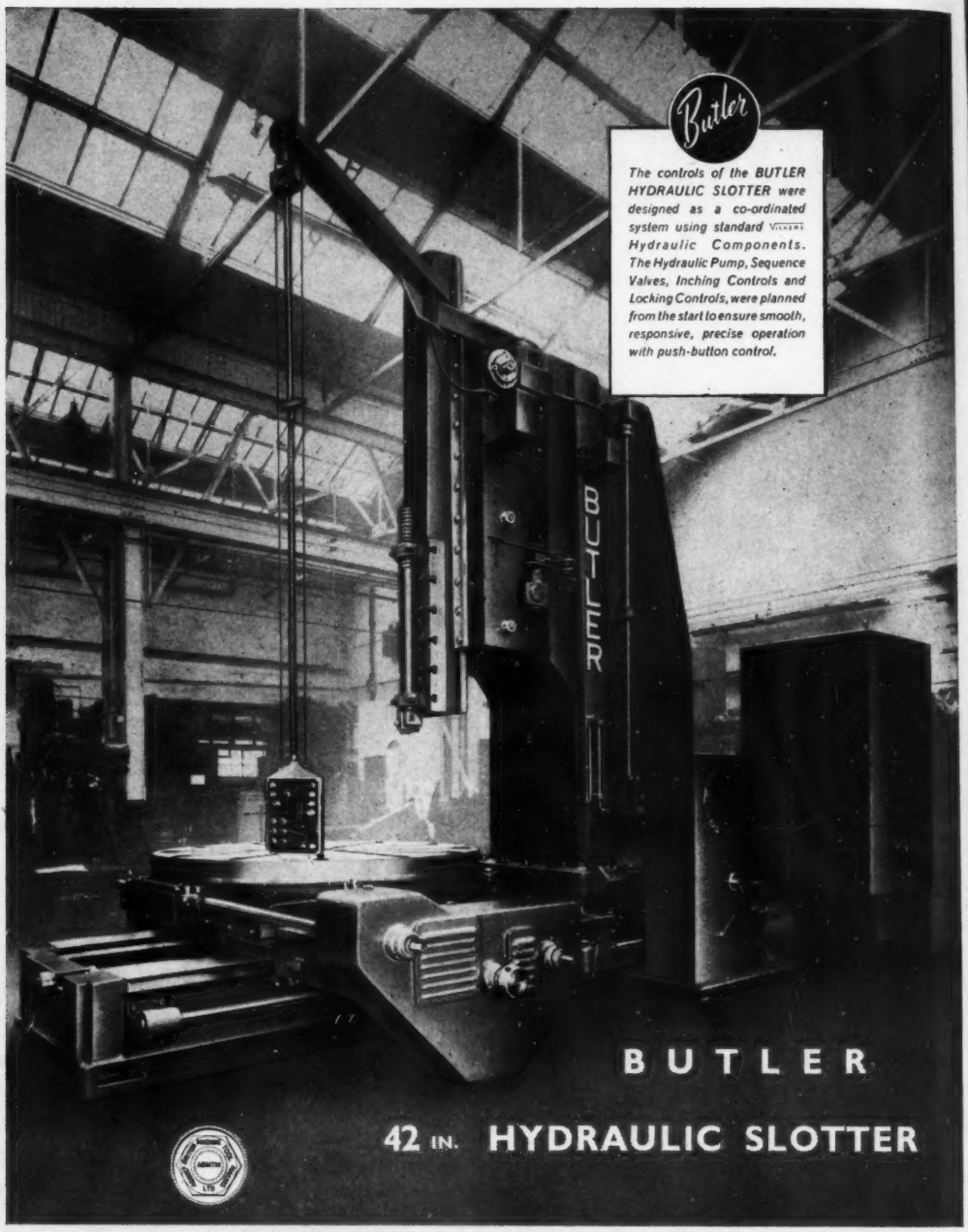
H. W. WARD & CO LTD

SELLY OAK, BIRMINGHAM 29

Phone : Selly Oak 1131

ASSOC. BRITISH MACHINE TOOL MAKERS LTD ABMTM

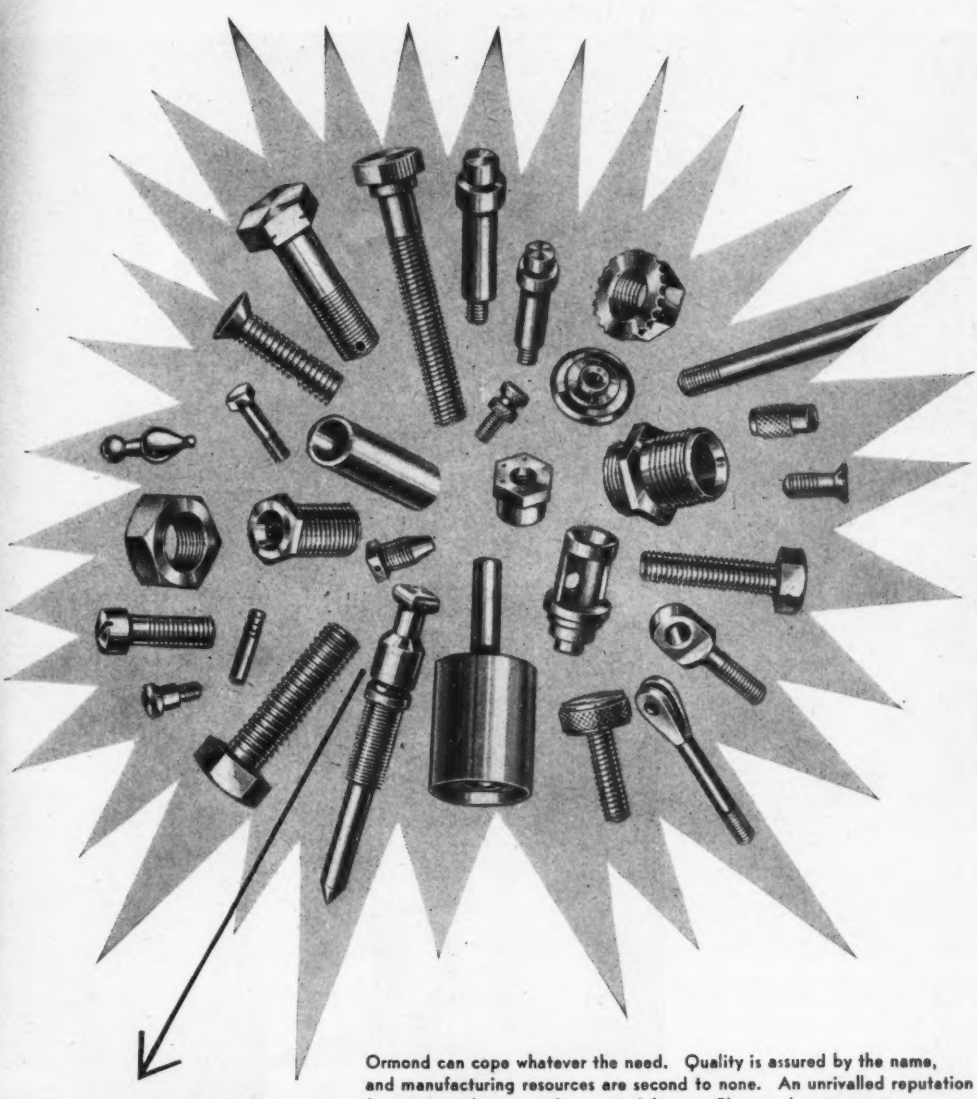
W.689


Butler
The controls of the BUTLER HYDRAULIC SLOTTER were designed as a co-ordinated system using standard Vickers Hydraulic Components. The Hydraulic Pump, Sequence Valves, Inching Controls and Locking Controls, were planned from the start to ensure smooth, responsive, precise operation with push-button control.
BUTLER
BUTLER
42 IN. HYDRAULIC SLOTTER

The BUTLER MACHINE TOOL Co. LTD

HALIFAX
ENGLAND
TELEPHONE 61641

FOR PLANING SHAPING AND SLOTTING MACHINES



Repetition work

Ormond can cope whatever the need. Quality is assured by the name, and manufacturing resources are second to none. An unrivalled reputation for service takes care of prompt delivery. Please ask us to quote. Any quantity.

The Repetition Parts range covers single and multi spindle automatics up to 1¼" dia., Brass, Steel and Light Alloy Screws in Rolled and Cut Threads, Grubscrews, Nuts, Allthreads, Hexagon Bolts and Setscrews turned from bar and Cold Headed Grades "A", "B", and High Tensile.

THE ORMOND ENGINEERING CO. LTD.
ORMOND HOUSE · ROSEBERY AVENUE · LONDON, E.C.1
Telephone: TERminus 2888 Telegrams: "Ormondengi, Cent."

When answering advertisements kindly mention MACHINERY.

The finest tools of their kind

ROHM

DRILL CHUCKS

SPIRO... recognised as the finest and most accurate keyless drill chuck in the world. Six sizes with capacities up to ⅝in. dia.

PRIMA... this key-type chuck is made to a very high degree of precision, but nevertheless, is cheaper than any other drill chuck of this type. Capacities up to 1 in. dia.

SUPRA... a general purpose keyless chuck, made to high standards and exceptionally reasonable in price. Capacities up to ½in.

Sole Importers for the United Kingdom

MICHAEL S. THOMPSON LIMITED

185/7 Hammersmith Road, London, W.6, England

TEL: RIVerside 7922/3 GRAMS: Tomtool, London, W.6

When answering advertisements kindly mention MACHINERY.

ultra precision and finish on parts SMALLER than a pin head

In the watch factory of ***S.SMITH & SONS (ENGLAND) LTD.***

Using

TORNOS

sliding head Automatics

The TORNOS sliding head automatic with its unequalled performance, is ideally suited to the large scale production of both simple and intricate high precision parts. Eight models are available in the TORNOS range, with stock capacities from four to 32 mm. Write for full details.

Brussels Fair, Sept. 3, 1961
Tornos Stand No. 2303
Hall No. 2
A complete Range of Tornos Machines will be on view.

TORNOS SALES CO. (E. M. VAUGHAN) LTD., 301 BROADGATE HOUSE, COVENTRY, ENGLAND.
TELEPHONE: COVENTRY 26815 TELEX: TORNOS, COV. 31541

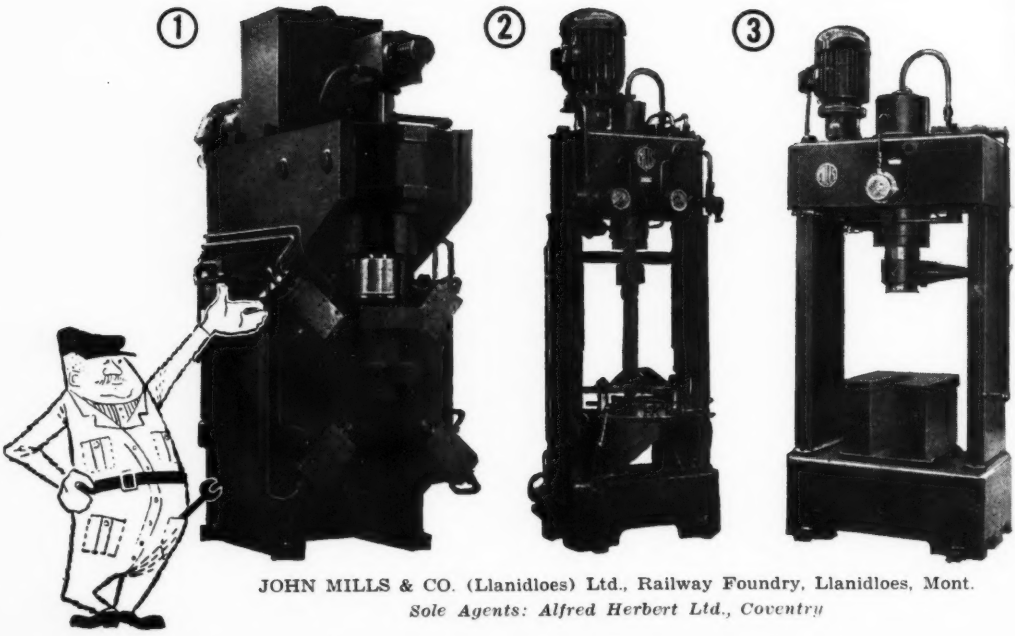
DO YOU KNOW WHAT WE'D LIKE TO SEE?

In any factory, if there's a job of work that would be done *better, quicker, cheaper,* by a Mills Oilaulic Press—we'd like to see a Mills Oilaulic Press doing it. If it was *your* factory, wouldn't you? Our design staff specialises in originating methods of manufacture and assembly to give higher productivity. Consult them now for the answer to your pressing problem.

Currently doing jobs better, quicker, cheaper are these three presses—

1. Mills 'Oilaulic' 300-ton vertical clamp and shear press.
2. Mills 'Oilaulic' 8-ton pull type double column broaching machine with special table and 10-ton clamping beam.
3. Mills 'Oilaulic' 60-ton vertical forcing press.

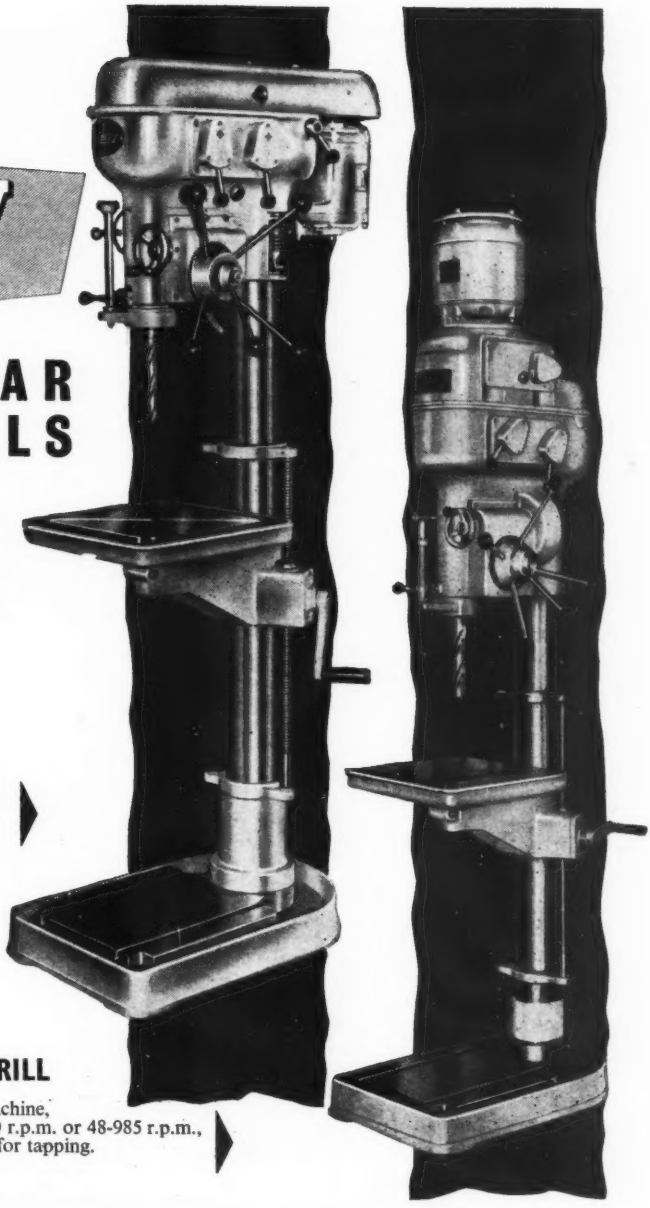
MILLS 'OILAULIC' PRODUCTS



JOHN MILLS & CO. (Llanidloes) Ltd., Railway Foundry, Llanidloes, Mont.
Sole Agents: Alfred Herbert Ltd., Coventry

KERRY

PILLAR DRILLS



These machines are renowned for their high standard of performance and dependability under the most arduous operating conditions to be found in industry today. Modestly priced, sturdily built and extremely versatile, they will give years of trouble-free service.

KERRY '100' POWER FEED PILLAR DRILL

A 1 inch capacity machine with nine speeds ranging from 70-1,500 r.p.m., a lever operated gear change with totally enclosed gear box and power feed, available with either a square or circular table.

KERRY '125' PILLAR DRILL

A 1¼ inch capacity, all-geared head machine, giving nine spindle speeds from 70-1,500 r.p.m. or 48-985 r.p.m., 3 rates of power feed reverse to spindle for tapping.

KERRY'S

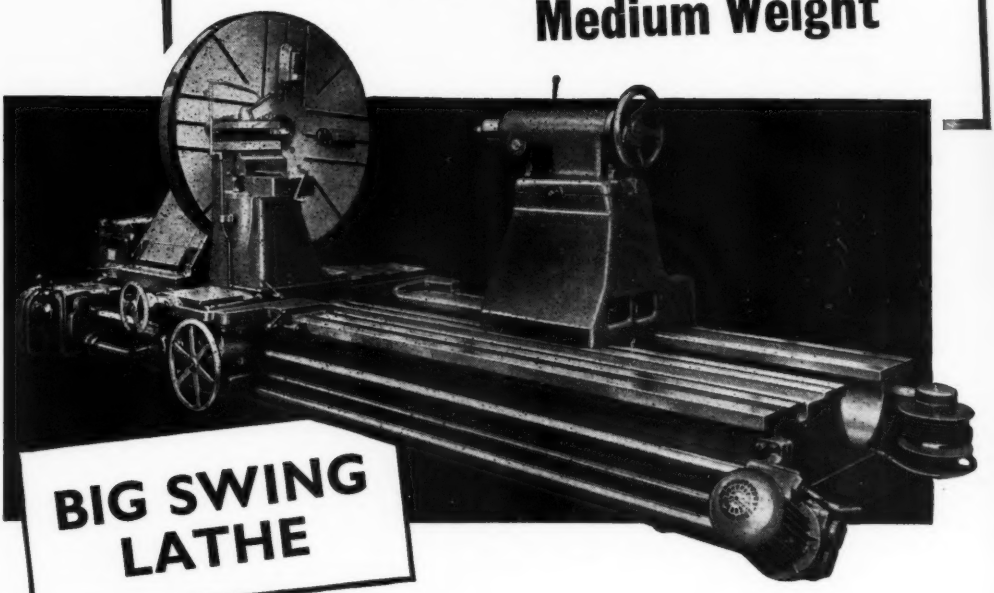
manufactured within the KERRY GROUP by
KERRY'S (Engineering) CO. LTD
GRANGE ROAD, LEYTON, LONDON, E.10

A Kerry COMPANY

Sales Office: WARTON ROAD, STRATFORD, LONDON, E.15. Telephone: MARyland 6611

F

For Turning LARGE Diameter Drums and Rollers of Medium Weight



BIG SWING LATHE

The O & S Range also includes:

SS & SC lathes from 10½ in. to 24 in. capacity; surfacing and boring lathes up to 96 in. swing; break lathes; railway carriage and wagon wheel lathes; axle journal turning and burnishing lathes; straightening presses.

This lathe will swing up to 6 ft. over the saddle and is specially designed for Turning Drums, Rollers, etc. It is easy to handle, economical in operation and competitively priced. The Big Swing also makes this an ideal machine for general maintenance work.

The O & S Big Swing Lathe incorporates all these features:

- Up to 6 ft. swing over saddle
- Up to 25 ft. between centres
- 12 spindle speeds
- Large hollow spindle
- Spindle bearings PB or Taper Roller
- 32 enclosed change feed and screw-cutting box
- Long lead cutting gear
- Quick power motion to saddle
- Power feed to compound top slide if required
- Power feed to loose headstock if required
- 30 or 35 H.P. motor drive

O S

manufactured within the KERRY GROUP by
OLDFIELD & SCHOFIELD CO. LTD
BOOTHTOWN, HALIFAX, YORKSHIRE

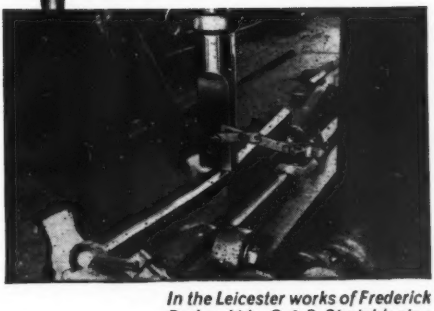
A Kerry COMPANY

Sales Office: WARTON ROAD, STRATFORD, LONDON, E.15. Telephone: MARyland 6611

O & S

STRAIGHTENING PRESSES

O & S Straightening Presses, made in 5 sizes with capacities ranging from 4 to 60 tons pressure, have for many years been the first choice of engineering firms throughout the world, including most of the leading motor manufacturers. For speed, accuracy and ease of operation, O & S Straightening Presses are in a class of their own.



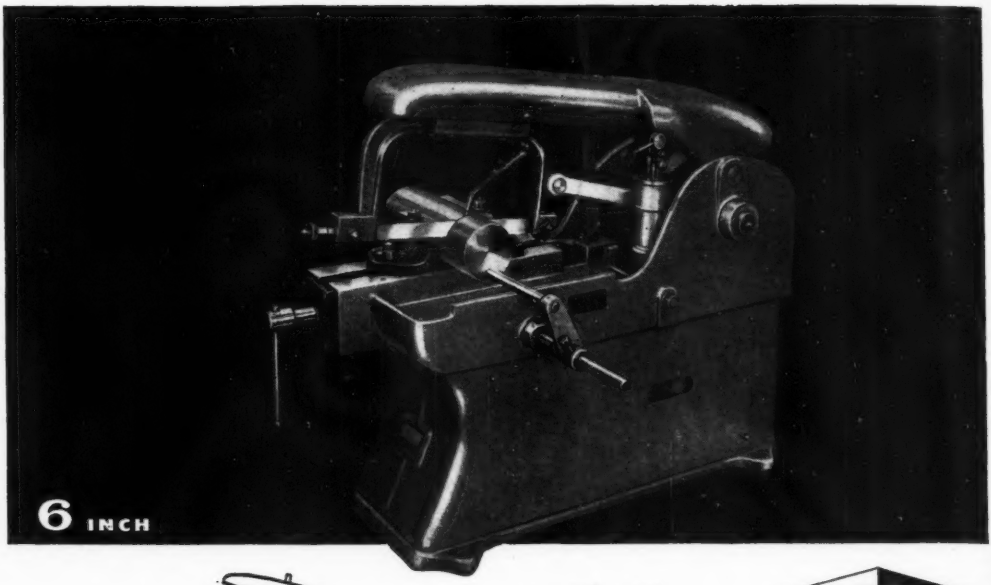
In the Leicester works of Frederick Parker Ltd., O & S Straightening Presses are in daily service ensuring that steel shafts are perfectly straight and true.

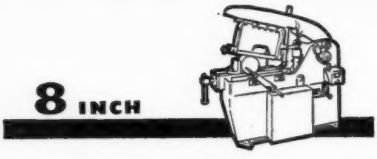
O & S

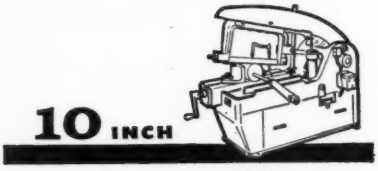
manufactured within the KERRY GROUP by
OLDFIELD & SCHOFIELD CO. LTD
BOOTHTOWN, HALIFAX, YORKSHIRE

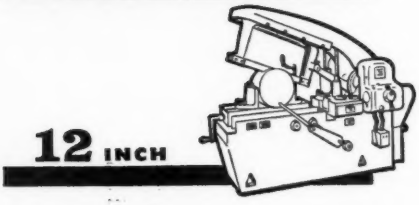
A Kerry COMPANY

Sales Office: WARTON ROAD, STRATFORD, LONDON, E.15. Telephone: MARyland 6611









Full details from your machine tool merchant or our Sales Office

The Famous Q&S

SAWMASTERS

are the finest HEAVY DUTY HACKSAWS in the world

Modern in design, robust and precise in construction, these unrivalled machine saws cut accurately and rapidly, and offer maximum production efficiency. Refinements include totally enclosed drive, hydraulic relief on the return stroke and automatic lifting of the bowslide to loading position on completion of cut.

Instant lever selection of correct cutting speed is a feature of all but the smallest model.

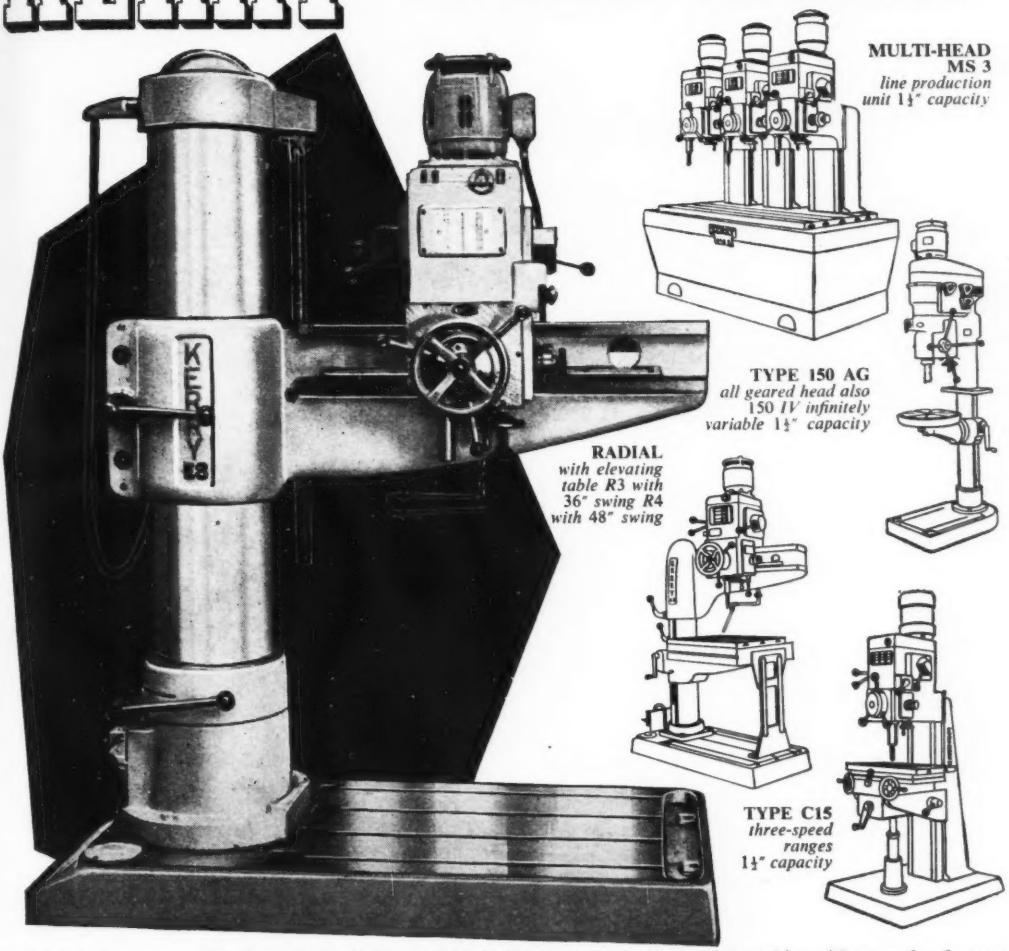
—and the famous SAWMASTER Autocut Power Bandsaw.

Q&S manufactured within the KERRY GROUP by
QUALTERS & SMITH BROS. LTD
BARNSLEY, YORKSHIRE
A Kerry COMPANY

Sales Office: WARTON ROAD, STRATFORD, LONDON, E.15. Telephone: MARyland 6611
Broadway/QS8

KERRY

RANGE OF
DRILLING MACHINES



Full details from your Machine Tool Merchant or our Sales Office

This Kerry Radial Drill type E (main illustration) is a 1½" capacity machine with many fine features. The E3 has a 46" swing and the E4, a 58" swing, drilling 37" and 49" out from column base respectively. Both models have nine spindle speeds, quick hand traverse, fine hand feed and three rates of power feed. The massive 2 member-column solid base, and heavy rigid box section arm are all well ribbed to fully withstand stress. The wide Kerry range also includes bench, pillar and line production models.

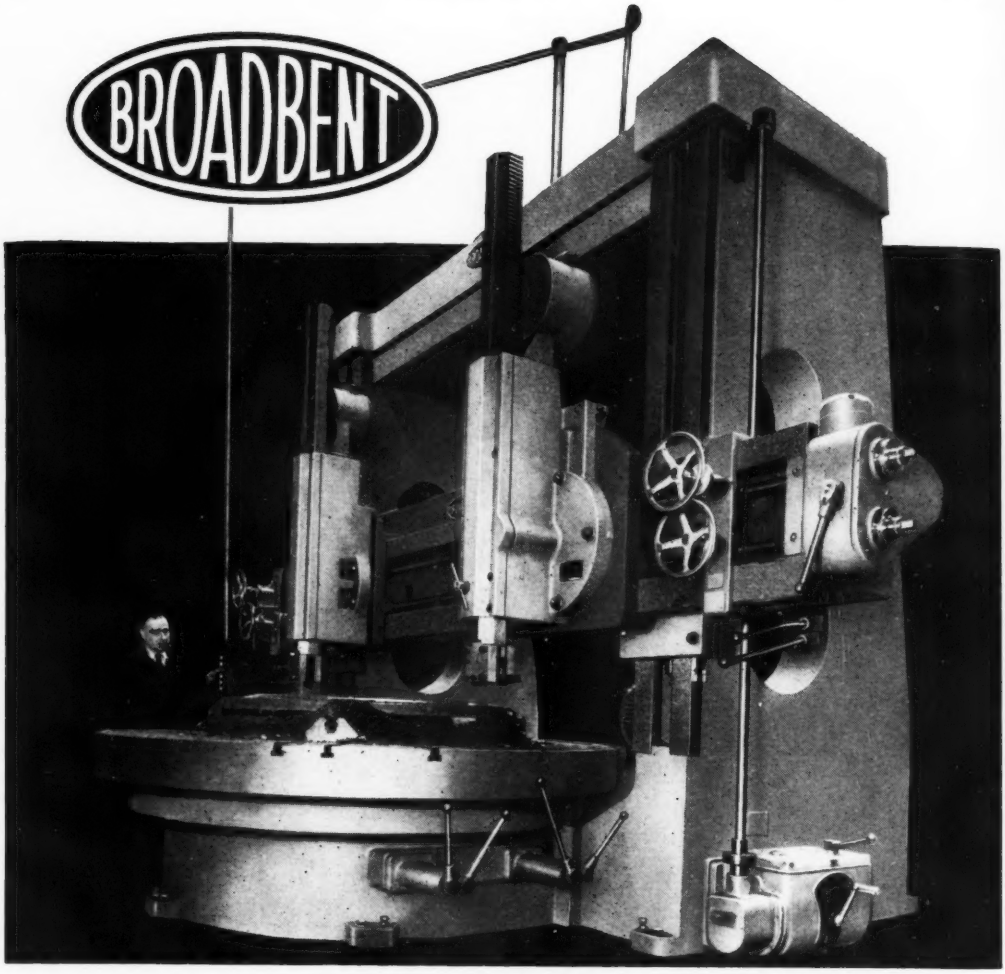
Q&S

manufactured within the KERRY GROUP by
QUALTERS & SMITH BROS. LTD
BARNSLEY, YORKSHIRE

A Kerry COMPANY

Sales Office: WARTON ROAD, STRATFORD, LONDON, E.15. Telephone: MARyland 6611
Broadway QS10

BROADBENT



HEAVY DUTY Vertical BORING & TURNING MILLS

with 5, 6, 8 or 10 ft diameter work tables

These incomparable machines are massively constructed for years of hard service. Accuracy and dependability are of the high order that industry has learned to expect of Broadbent Machine Tools. Notable features of these Boring and Turning Mills include twelve changes of speed and six changes of feed, controllable from either side of the machine; spiral bevel and spur reduction gears driving the work table; pendant control of rams and cross slides; and rapid power traverse with independent control of the two heads.

Please write for fully illustrated brochure.

BROADBENT

manufactured within the KERRY GROUP by

HENRY BROADBENT LIMITED

SOWERBY BRIDGE, YORKSHIRE

A Kerry COMPANY

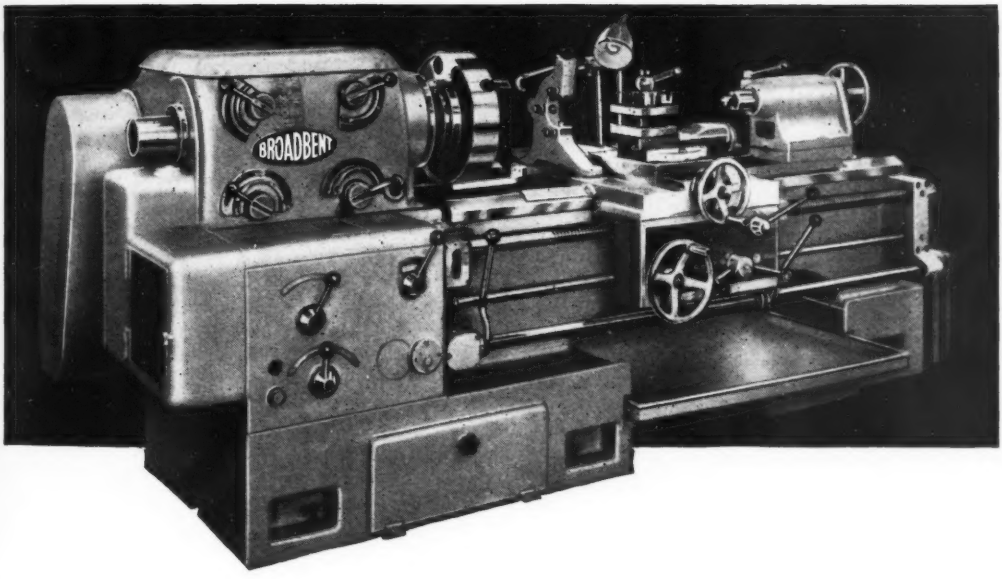
Sales Office: WARTON ROAD, STRATFORD, LONDON, E.15. Telephone: MARyland 6611

Broadway/H150

MORE output per man-hour with

BROADBENT LATHES

Good men plus good tools equal good output. Every Broadbent lathe incorporates almost a century of machine tool building. Manufacturers know that for versatility, accuracy and reliability there is nothing quite as good as a Broadbent Machine Tool.



This 18/22" Swing Heavy Duty Centre Lathe of modern design is a typical example of the Broadbent range. It has a 15 h.p. drive motor and spindle speeds up to 1,000 r.p.m.

The Broadbent range of Machine Tools includes Surfacing and Screw-cutting Lathes from 17" to 72" swing, Surfacing and Boring Lathes, Break Lathes, Crankshaft Lathes and vertical Turning and Boring Mills with 5', 6', 8' or 10' capacity.

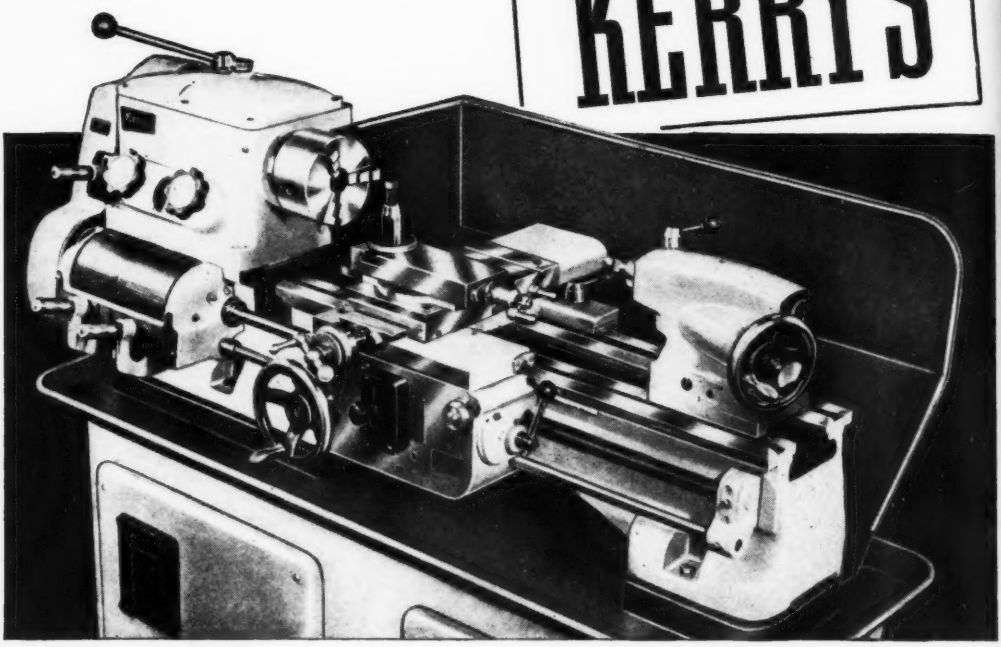
BROADBENT

manufactured within the KERRY GROUP by
HENRY BROADBENT LIMITED
SOWERBY BRIDGE, YORKSHIRE

A Kerry COMPANY

Sales Office: WARTON ROAD, STRATFORD, LONDON, E.15. Telephone: MARyland 6611
Broadway/HB9

MORE AND MORE ARE TURNING TO KERRY'S



11" SWING LATHES

THOUSANDS in use in Great Britain and throughout the World!

★ SLIDING, SURFACING AND SCREWCUTTING LATHE

★ ALL GEARED HEADSTOCK GIVING 9 SPEEDS RANGING FROM 39-1500 r.p.m.

★ TYPE LOO PRECISION TAPERED SPINDLE NOSE

★ FEED BOX GIVES 62 PITCHES AND 7 FEEDS FROM ·0004 in.-·024 in.

★ CAMLOCK TAILSTOCK

★ BEDWAYS AND SLIDES PRECISION GROUND

★ HARDENED BEDWAYS OPTIONAL EXTRA

KERRY'S

manufactured within the KERRY GROUP by
KERRY'S (Engineering) CO. LTD
GRANGE ROAD, LEYTON, LONDON, E.10

A Kerry COMPANY

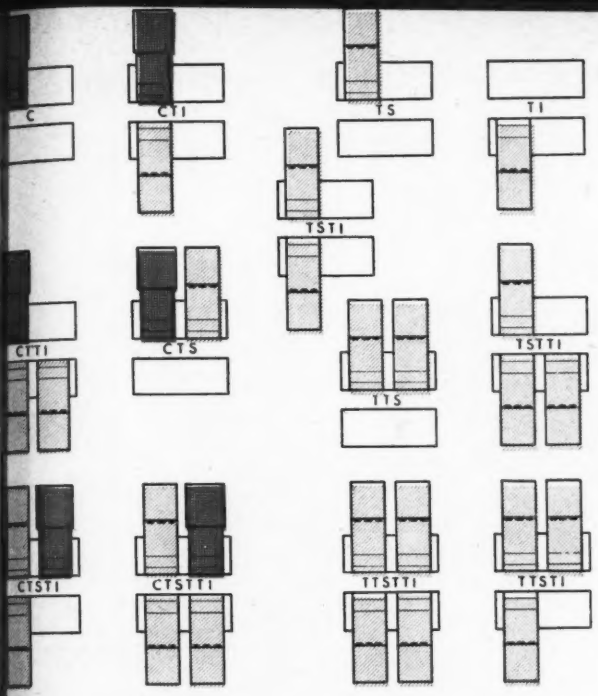
Sales Office: WARTON ROAD, STRATFORD, LONDON, E.15. Telephone: MARyland 6611

6, 1961

.m.

PANY

6611



13

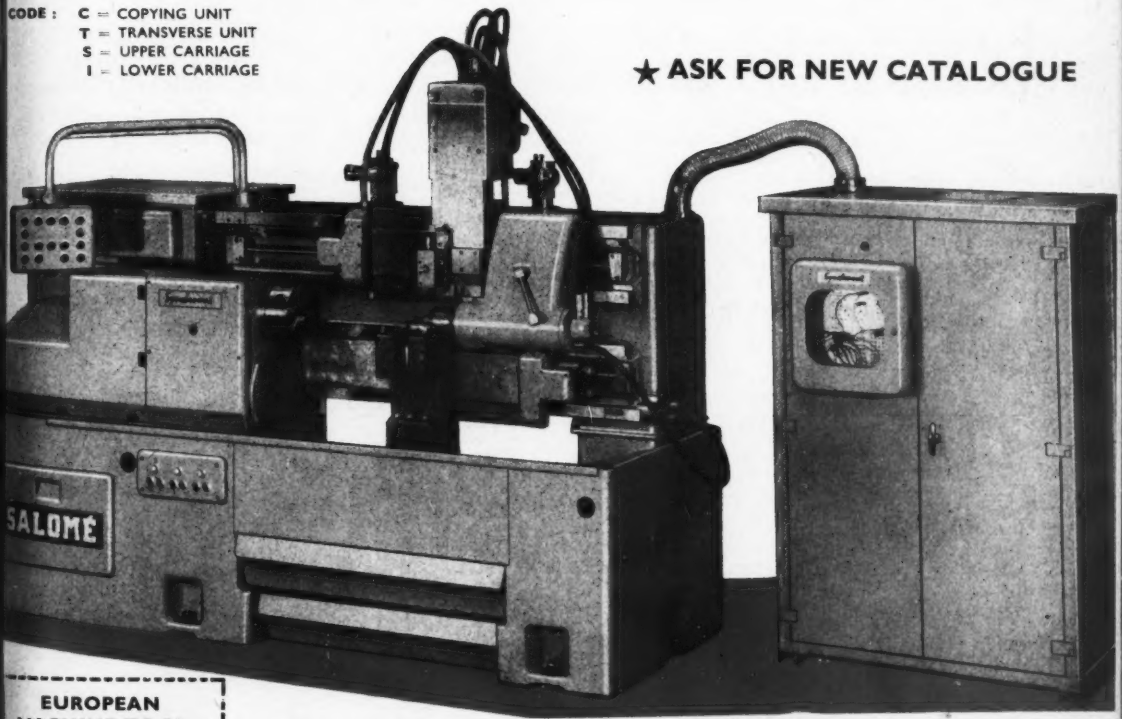
Combinations with the

Syncromat

Programme-Controlled multi-tool and Copying Production Lathe

CODE : C = COPYING UNIT
T = TRANSVERSE UNIT
S = UPPER CARRIAGE
I = LOWER CARRIAGE

★ **ASK FOR NEW CATALOGUE**

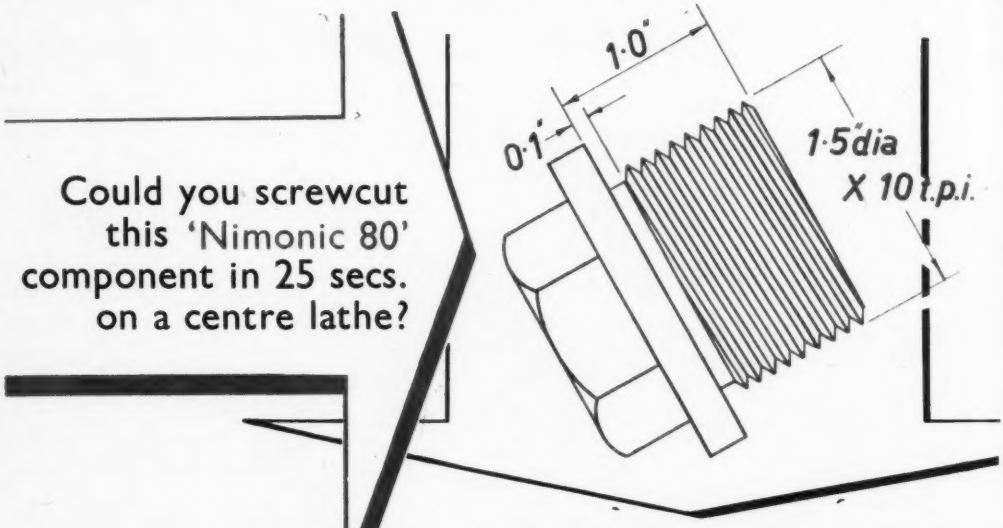


EUROPEAN MACHINE TOOL EXHIBITION, BRUSSELS
SEPT. 3rd to 12th, 1961
STAND 4205
HALL 4

Telephone: GERRARDS CROSS 4210
Telegrams: MACHINERY, GERRARDS CROSS
WOODSIDE HILL, CHALFONT ST. PETER, BUCKS.

Sole U.K. Distributors:

DORMAN MACHINERY SALES LTD



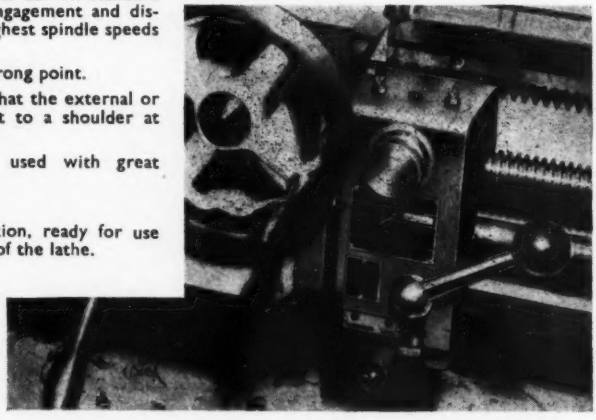
Could you screwcut this 'Nimonic 80' component in 25 secs. on a centre lathe?

The answer is 'yes' if you fit an 'AINJEST' high speed screwcutting attachment!

For 1 off and upwards Toolroom or Production — setting time is negligible.

In the same way that the chasing dial has superseded the old method of marking chuck, headstock, leadscrew collar and bracket; the AINJEST HIGH SPEED SCREWCUTTING ATTACHMENT has established a further major advance in screwcutting techniques. Its use on standard centre lathes allows the automatic engagement and disengagement of the leadscrew at the highest spindle speeds of which the machine is capable.

- ★ The cut cannot be started at the wrong point.
- ★ The cut is stopped accurately so that the external or internal threads can be cut tight to a shoulder at high speeds.
- ★ Tungsten carbide tools can be used with great advantage.
- ★ Chasing dial is eliminated.
- ★ The attachment remains in position, ready for use without restricting the versatility of the lathe.



AINJEST *High speed* **SCREWCUTTING ATTACHMENT**

Write for details and prices to Dept. A.S.C

● *stockists of* "KENNET" *carbide threading and turning tools*

SAUNDERSON & COSTIN LTD. · HIGHCLERE · NEWBURY · BERKS · ENGLAND · *Tel:* HIGHCLERE 448

PRECISION FLAT LAPPING ON A LOW-COST PRODUCTION BASIS

Lapmaster can handle components of dissimilar shapes and dissimilar materials simultaneously.

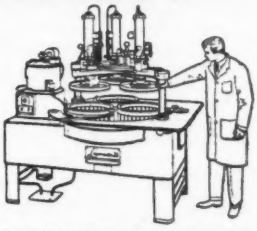
with Lapmaster

Lapmaster produces a high order of flatness, and surface finish, on turned, milled, ground and even cast components. Both in quality and in cost, hand-lapping and other production methods are outstripped by Lapmaster.

With only semiskilled operation, Lapmaster can achieve accuracies of better than one light band—or ten millionths of an inch—across faces of up to 8 inches in diameter and comparable accuracy on larger diameters.

we'll show you

Send us a sample batch of parts with your own accuracy specifications. We will lap them, free of charge, and return them with production data and a quotation for our Job Lapping Service which we are confident will impress you. Or simply send for your set of Lapmaster technical publications.



LAPMASTER (12″, 24″, 36″, 48″, 72″ and 84″ dia. lapping plates) can produce accuracies to light band specifications and surface finishes as required on materials as diverse as steel, 'Stellite', tungsten carbide, cast iron, plastics, 'Monel', aluminium, bronze, quartz.

PAYNE PRODUCTS INTERNATIONAL LIMITED

Head Office & Works:
Buckingham Avenue, Trading Estate, Slough, Bucks.
Tel: Slough 26741/4
Grams: Paynpro, Slough
Telex: 84165

Sales, Service & Job Lapping facilities also at:
Blackbraes Road, Nerston Industrial Area, East-Kilbride, Glasgow
Tel: East Kilbride 21247
Moll Springs, Netherton, nr. Huddersfield, Yorks. Tel: Honley 61543

If you want to know something about
BORING & TURNING MILLS...

SEE YOUR COMPETITORS!

If your business requires the boring and turning of medium to large castings and forgings or similar components, and you do not use Webster and Bennett Boring Mills, it's highly probable your competitors do.

In that case, they'll be getting the benefit of lower overheads, because on the bases of capital costs and running costs there are no other machines quite as economical.

Powered for carbide tooling and high metal removal rates; centralised hydraulic controls for operating convenience; easy reservicing when necessary assisted by unit construction; self-compensating clutches obviating frequent adjustment for wear, are some of the outstanding features of these machines.

Add to this the fact that they are probably the most reasonably priced machines of their kind, and the reasons for their increasing demand become clear.

The illustration shows one of the battery of Webster and Bennett Boring Mills installed in the London Works of Dewrance & Co. Ltd., facing, turning, boring and screwing 5" valve bodies in a floor to floor time of 66 minutes.

WEBSTER & BENNETT LTD., COVENTRY, ENGLAND

When answering advertisements kindly mention MACHINERY.

Superb performance
Attractive price
Quick delivery

All models complete with Standard Equipment including :

- Cos-par Universal Dividing Head
- Vertical Milling Attachment
- Arbor
- Front Support Braces

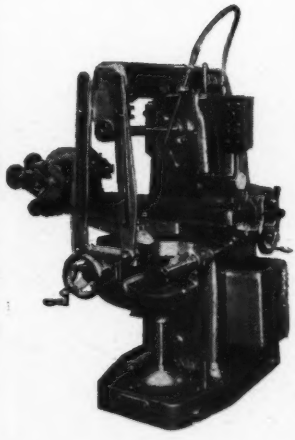
Specification :

Model	No. 0	No. 1	No. 2
Table	34" × 8¼"	39⅜" × 9"	48" × 11"
Long. Trav.	20"	26"	29"
No. of Speeds	12	9	18
Speeds R.P.M.	32-1000	60-1200	40-2000
Spindle Nose	No. 40	No. 40	No. 40
PRICE ★	£880	£1100	£1825

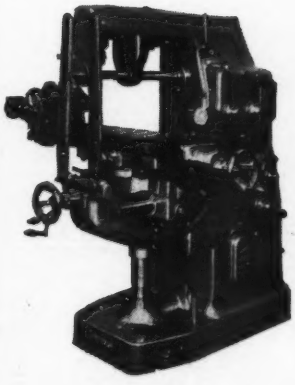
TEST

UNIVERSAL MILLING MACHINES

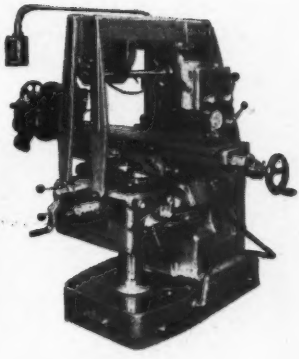
Model 0



Model 1



Model 2



★ Special terms for members of B.A.M.T.M.

HERBERT WIDDOWSON & SONS LIMITED

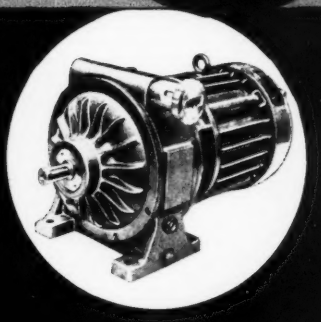
Canal Street Works, Nottingham. Tel : 51891 (4 lines) Grams : TOOLS, NOTTINGHAM

- Range 1/33 h.p. to 15 h.p.
- 9 to 1 stepless speed variation.
- Flange mounted motors (when required).
- Flange mounted Reduction Gears for low output speeds.
- Exceptionally light, sensitive, and accurate control of speed settings by handwheel, pneumatic, mechanical or electrical remote control.

Technical Representatives in

LONDON
BIRMINGHAM
MANCHESTER
LEEDS
BRISTOL
GLASGOW

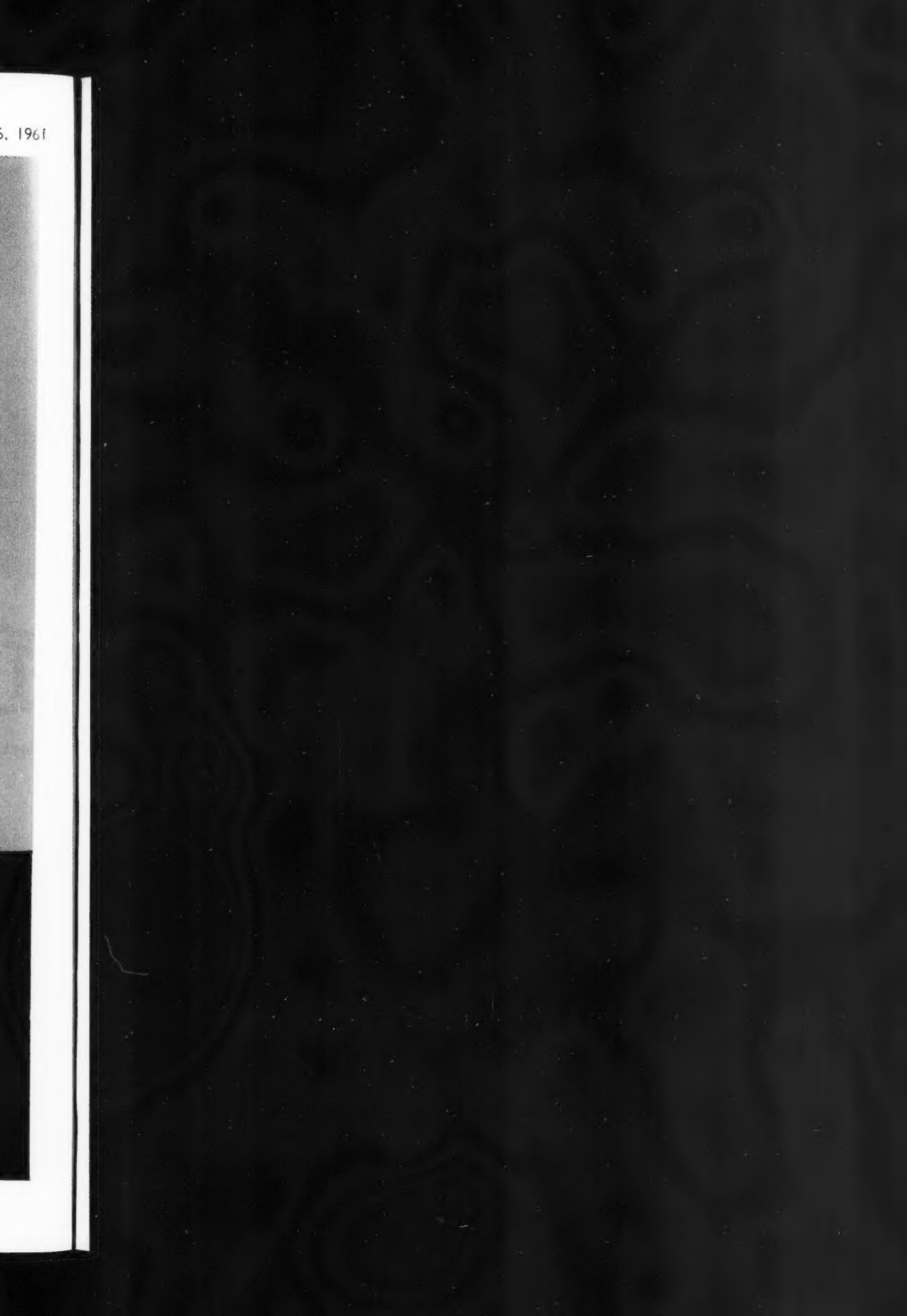
Kopp
VARIATORS



CONTROLLED VARIABLE SPEED

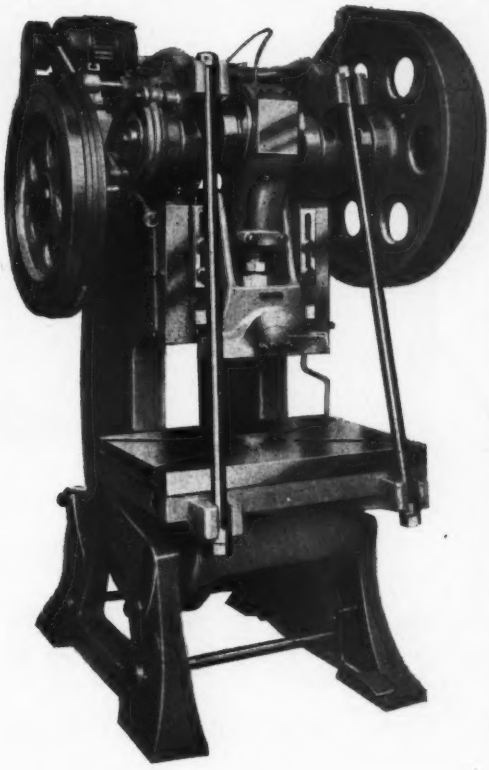
ALLSPEEDS LIMITED

Royal Works - Clayton-le-Moors, P.O. Box 43, Accrington, Lancashire - Telephone Accrington 35441 (6 lines)



HERCULES

INCLINABLE OPEN FRONT GEARED POWER PRESS WITH ADJUSTABLE STROKE



★ BODY & TABLE IN ONE HIGH-GRADE GREY IRON CASTING

★ CRANKSHAFT AND STROKE ADJUSTING BUSH OF NICKEL CHROME STEEL

★ PRESSURE LUBRICATION SYSTEM

★ FRONT TIE BARS

★ BRITISH-MADE ELECTRICAL EQUIPMENT

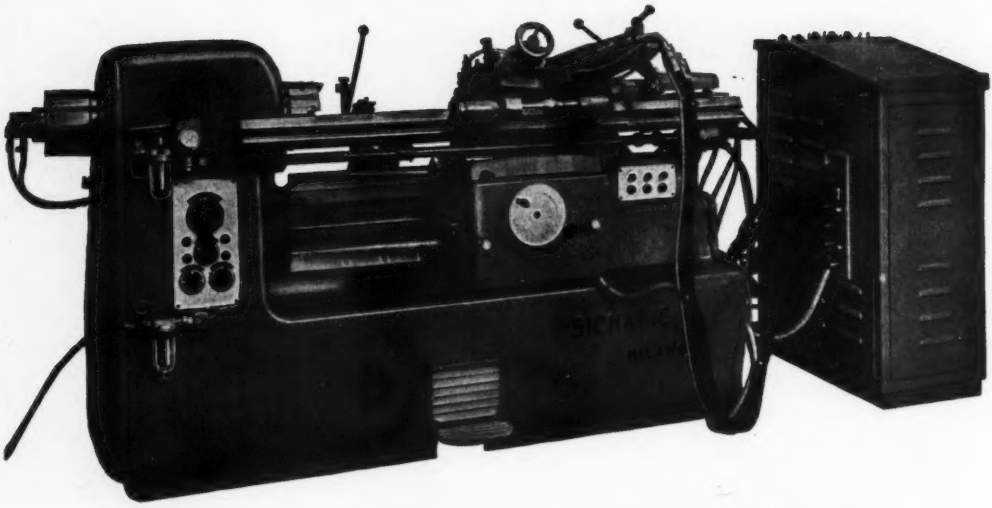
SPECIFICATIONS

TYPE	T.180	T.120	T.100	T.60	T.40	T.40 U.G.	T.30	T.30 U.G.	T.20 U.G.
Appr ox. Normal Pressure	180 Tons	120 Tons	100 Tons	60 Tons	40 Tons	40 Tons	30 Tons	30 Tons	20 Tons
Strokes per Min.	30	30	40	60	70	110	90	90	100
Stroke Ajj. from	¾"—7"	¾"—5¼"	⅜"—4½"	¼"—4½"	⅜"—3½"	⅜"—3½"	¼"—3½"	¼"—3½"	¼"—2½"
Size o Bed	39½" × 27½"	39½" × 26"	35½" × 24½"	29½" × 17½"	26" × 15½"	26" × 15½"	15" × 22½"	15" × 22½"	13" × 18"
Depth of Throat	14½"	14"	13"	9½"	8½"	8½"	7½"	7½"	6½"
Height of Bolster to Guides	18"	18"	15½"	13½"	12½"	12½"	11½"	11½"	11"
Max. Shut Height	12½"	11½"	10½"	9½"	8½"	8½"	9"	9"	9"
Distance between Frames	17½"	15"	14"	11½"	11"	11"	9"	9"	9"
PRICE:	£2,661	£1,666	£1,473	£898	£715	£656	£532	£468	£425

U.G. Signifies Un-geared Machine

SPECIAL TERMS TO MEMBERS OF B.A.M.T.M.

HERBERT WIDDOWSON & SONS LIMITED
CANAL STREET WORKS NOTTINGHAM
TELEPHONE: 51891 (3 lines) TELEGRAMS: TOOLS NOTTINGHAM



The new
SICMATIC

AUTOMATIC & SEMI-AUTOMATIC HYDRAULIC PROFILING LATHES

Duplomatic Hydraulic System.
Hardened Bed Slideways.
Auto cycling up to six depths of cut.
Hydraulic tailstock for drilling and boring.
Uses template or existing component.
Eight models to choose from.

Basic price under £2,500.

SPECIFICATION

Bore of spindle	2¼in.
Spindle nose	5in. A.S.A.
Max. swing over bed	15¼in.
Max. swing over saddle	9¾in.
Max. length turned	27½in.
Hydraulic traverse of copying slide	4in.
Hydraulic feed of tailstock spindle	4¾in.
Number of feed rates to copying slide	48
Max. tool pressure	1,300 lbs.

EARLY DELIVERY

DAILY DEMONSTRATIONS AT OUR WORKS:

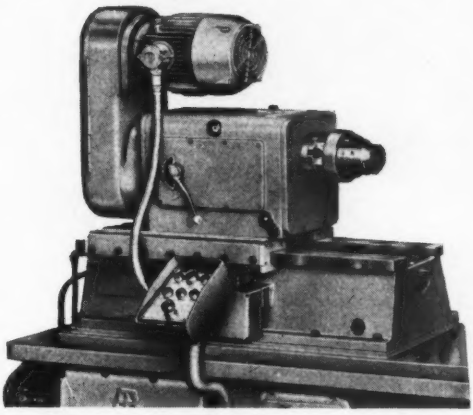
HERBERT WIDDOWSON & SONS LIMITED
CANAL STREET WORKS NOTTINGHAM
TELEPHONE: 51891 (3 lines) TELEGRAMS: TOOLS NOTTINGHAM

BERARDI

A name in Europe synonymous with

AUTOMATION

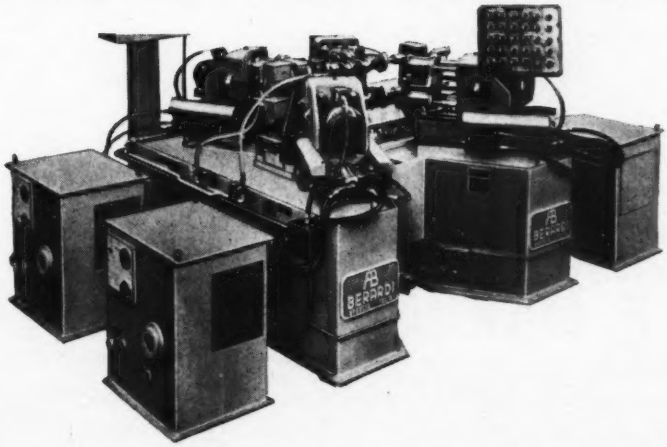
- Electro-Hydraulically Controlled
- Flexibility with standardisation of Units
- Handling reduced to minimum
- Consistent Production



Our Development Engineer always available for discussion

Tel: Nottingham 51891
Cheswardine 277

HERBERT WIDDOWSON & SONS LTD



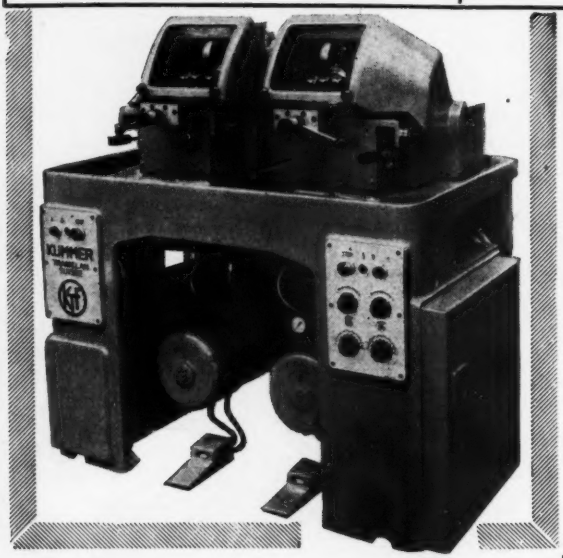
CANAL ST.
WORKS
NOTTINGHAM

Tel: 51891
(4 lines)

Grams: TOOLS
NOTTINGHAM

KUMMER K20

SEMI-AUTOMATIC TWIN HEAD PRECISION LATHE



with NEW features

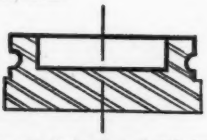
Ideal for second-operation work on concentric and profile shaped parts, including bar work, castings, forgings, stampings, etc. New device for stopping spindle in a set position for loading components. Two speed device is fitted so that the work head spindle can automatically operate at high or low r.p.m. according to preselected cutting speeds. Camshaft driven from the main spindle.

Example of
KUMMER *Productivity*

Cam accelerator is another accessory to reduce machining cycle time. Tool setting can be carried out away from the machine with a special tool setting gauge.

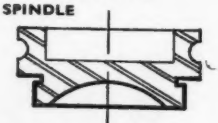
Each work head is completely screened. By means of a cam mechanism fitted to the end of the tool slides, the retraction of these slides carrying the cutting tools can be made to allow easy loading of components into the chucks.

No. 1 SPINDLE



Material: Stainless steel (163 Brinell).
Cycle time: 47 secs.
Loading: 6 secs.
Scale: 1 : 1.

No. 2 SPINDLE



Material: Component from Op. 1 as above
Cycle time: 47 secs.
Loading: 6 secs.
One complete piece in 53 secs. utilising the unique features of the KUMMER Model K.20 machine.

GASTON E. MARBAIX LTD.

BRUSSELS FAIR
VISIT STAND No. 2207
HALL 2 AND SEE THIS COMPONENT BEING MACHINED

DEVONSHIRE HOUSE, VICARAGE CRESCENT, BATTERSEA, LONDON, S.W.11 **Phone: Battersea 8888 (8 lines)**

NRP 3241

1961

D

es

k
d
,
v
t
.
e
y
.
g
e

,

2207
THIS
NG

ines)
41

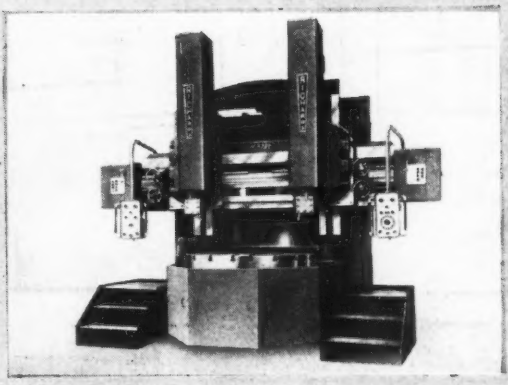
The Kingfisher (Alcedo ispida) nests at the end of a narrow tunnel which it burrows into the bank of a stream, river, pond or lake. The burrow slopes gently upwards for many feet and once constructed is used for many years. In strange contrast to the brilliant plumage of the bird, its burrow is usually in a foul condition being littered with fish-bones and other refuse.

The Alcedo Ispida is Efficient But hardly a

PRECISION BORER

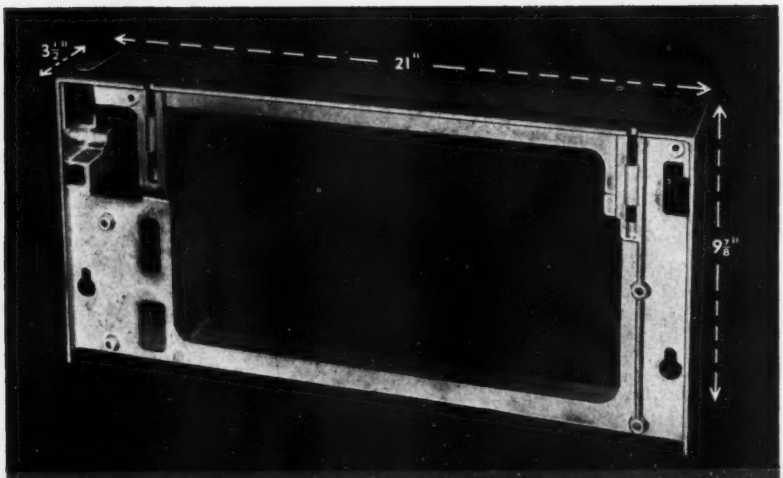
HORIZONTAL and VERTICAL BORERS produced by GEORGE RICHARDS & CO. LTD., however are unsurpassed for precision speed and adaptability. Continuous research and development keep RICHARDS borers way ahead of all others.

Illustrated right is a RICHARDS VERTICAL BORING MILL, supplied in a range with table capacities from 5ft. to 10ft., with or without side-head. The complete range of machines includes table capacites up to 50ft.



RICHARDS

GEORGE RICHARDS & CO. LTD.
BROADHEATH - ALTRINCHAM - CHESHIRE
Sole Agents: ALFRED HERBERT LTD., FACTORED DIVISION, COVENTRY.
Tayson R504



Hub grill frame—finished weight 4.20 lbs. Cast by the Birmingham Aluminium Casting (1903) Co., Ltd. using KE A. 145 steel die. Photograph by courtesy of Cannon Industries Ltd.

WHY MORE AND MORE PRESSURE DIE CASTINGS ARE BEING MADE IN DIES OF . . .

KE A145

5½% CHROME VANADIUM MOLYBDENUM STEEL

AND

KE 896

MEDIUM CARBON CHROME VANADIUM STEEL

BECAUSE KE Steels are electrically melted to close limits of analysis and regularity of properties.

BECAUSE KE Die blocks are ultrasonically tested.

BECAUSE KE Die steels are ready for quick delivery from large stocks.

BECAUSE KE Heat Treatment Service is available for all dies made from KE steels.

KAYSER ELLISON & CO. LTD

CARLISLE STEEL WORKS · SHEFFIELD 4
Telephone : SHEFFIELD 22124 ESTABLISHED 1825

LONDON STOCK WAREHOUSE :
4 Pembridge Mews, Notting Hill Gate, W.11. Telephone : BAYswater 9131/2

MIDLAND STOCK WAREHOUSE :
Station Road, Coleshill, Birmingham. Telephone : Coleshill 2041/2

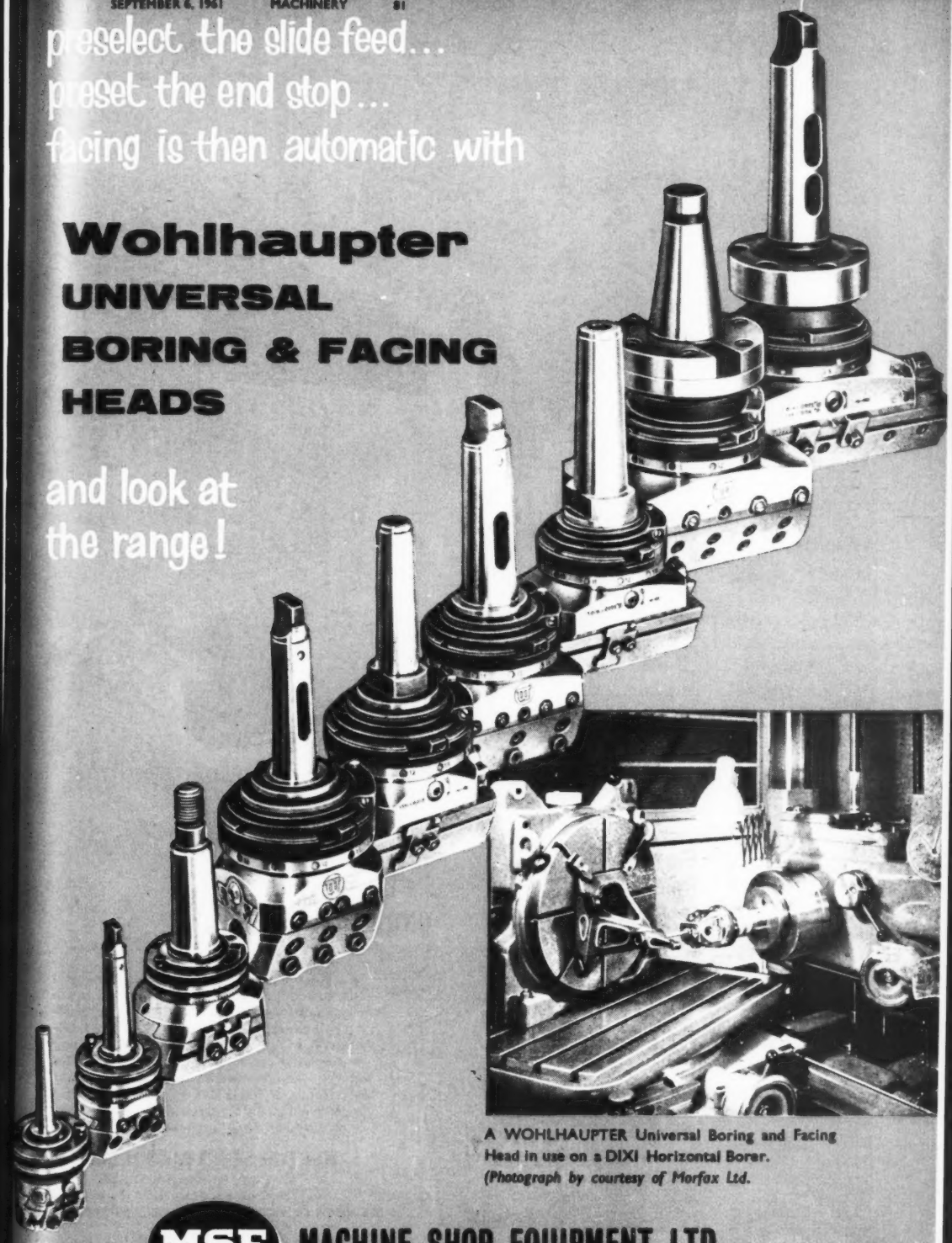
This booklet, giving greater detail of these and other steels, is available free on request.

, 1961

preselect the slide feed...
preset the end stop...
facing is then automatic with

Wohlhaupter
UNIVERSAL BORING & FACING HEADS

and look at the range!



A WOHLHAUPTER Universal Boring and Facing Head in use on a DIXI Horizontal Borer.
(Photograph by courtesy of Morfax Ltd.

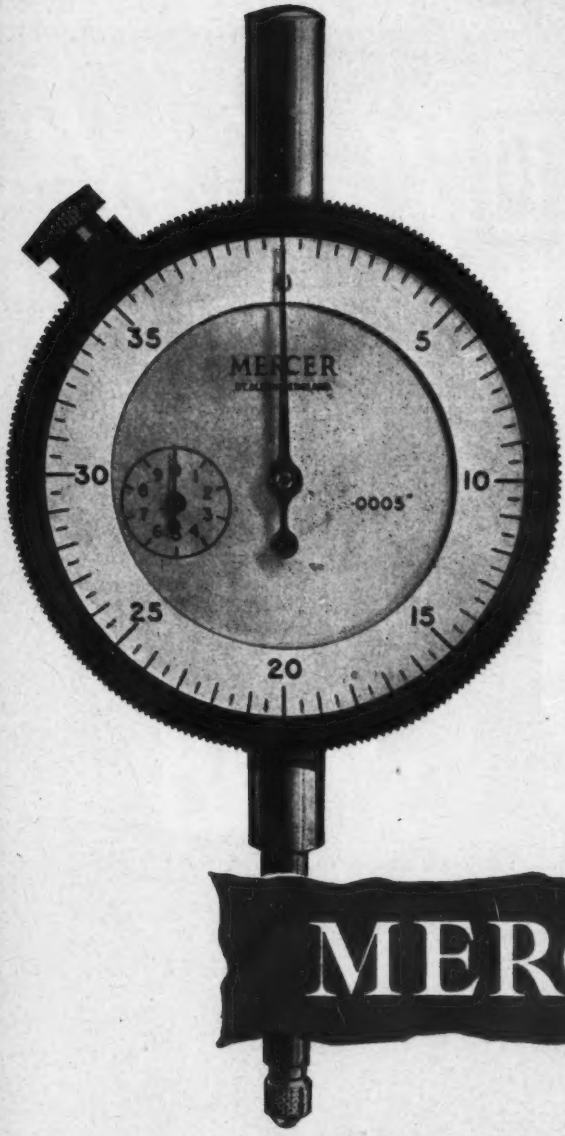
MSE MACHINE SHOP EQUIPMENT LTD.

Spenser Street, London S.W.1 Telephone: VICtoria 6086

GD.643

IS YOUR
PLANT
GROWING?
TRADE
KEETONA
MARK
SHEET
METAL
SHEARS
Are you thinking of adding a new sheet metal shear to your present plant? Then you're in the Keetona territory—this is the field we've specialised in for years. Streamlined design and fabricated steel construction are two of the outstanding features of Keetona Shears—they're made for today's conditions when you have to work your plant non-stop to get prices down to competitive levels. We'll gladly send full information on the range we make. Hire purchase terms available.
KEETON SONS & CO. LIMITED
KEETONA WORKS, GREENLAND ROAD
SHEFFIELD 9. TEL: SHEFFIELD 42961/4
A MEMBER OF THE FIRTH CLEVELAND GROUP

CRC 13KM



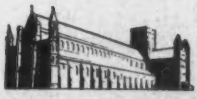
Dial Gauges

- Mercer offer the most complete range of dial gauges in Europe.
- Absolute reliability and accuracy.
- Comprehensive repairs and spares service available.
- There is a department devoted exclusively to special applications, where your individual problems can be investigated and solved.

MERCER

ONE HUNDRED YEARS OF FINE MEASUREMENT

THOMAS MERCER LIMITED



of St. Albans, Hertfordshire. TELEPHONE ST. ALBANS 55313

Scottish Office: J. F. Tennent Ltd., 52, St. Enoch Square, Glasgow, C.1.

MP 2427

NOBLE & LUND 'fluifeed'
MODEL AL/CC

COLD SAWING MACHINES

Designed out of forty years' experience, devoted to cold sawing problems, the Model AL/CC, with its proven "Fluifeed" hydraulic feed, ample power and "Insto" segmental saw, is setting up the highest standards of performance on bars, billets and sections.

7 STANDARD SIZES

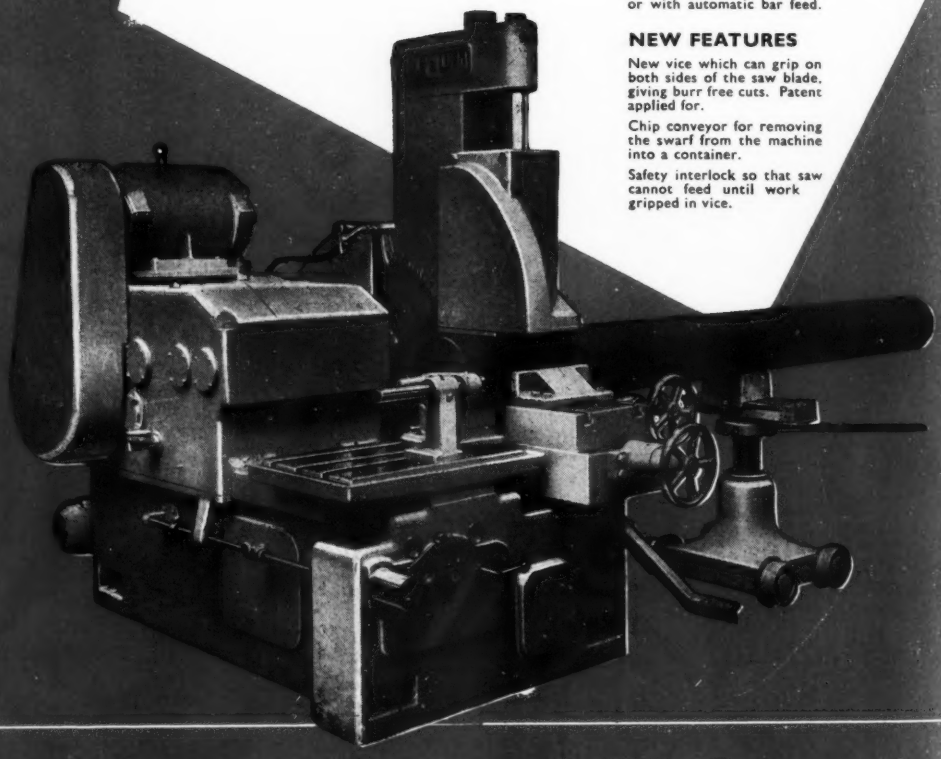
Saw blades from 11in. to 72in. dia. for sawing work 1in. to 26in. dia. Machines can be supplied as standard or with automatic bar feed.

NEW FEATURES

New vice which can grip on both sides of the saw blade, giving burr free cuts. Patent applied for.

Chip conveyor for removing the swarf from the machine into a container.

Safety interlock so that saw cannot feed until work gripped in vice.



NOBLE & LUND
NORTHERN MACHINE TOOL WORKS PELLING-ON-TYNE
TELEPHONE: FELLING 69-2272 TELEGRAMS: LATHES, GATESHEAD.

price for capacity

With over half-a-century's precision engineering experience and twenty years devoted to specialised development of jig boring machines, Newall proudly acclaim model 1520 as an outstanding achievement in their long series of successes. Material, craftsmanship, performance and accuracy of the machine set a new standard for medium capacity jig borers, produced at a price which will appeal to the toolmaker or large user.

the world's best value

principal features

- TABLE SIZE 15" x 20"
- DESIGNED FOR TOOLROOM WORK OR LIGHT PRODUCTION BORING
- COMPLETELY SELF-CONTAINED
- 12 SPINDLE SPEEDS IN RANGE 67–3,000 R.P.M.
- 3 POWER FEEDS UP AND DOWN
- SIMPLE TO INSTALL, OPERATE AND MAINTAIN

NEWALL MODEL 1520 JIG BORING MACHINE

ask for publication 106/58

NEWALL

NEWALL GROUP SALES LIMITED

PETERBOROUGH PHONE 3227-8-9

MACREADY'S

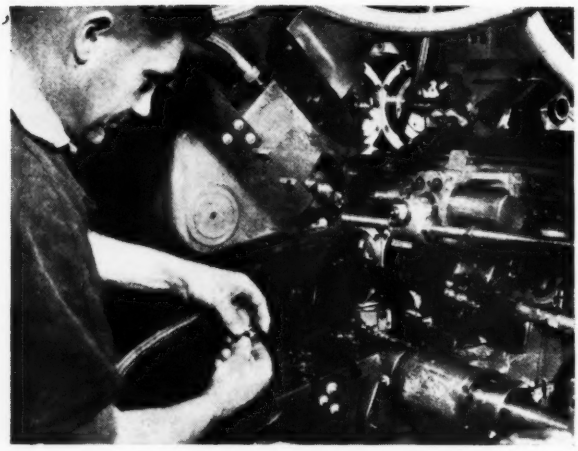
USALED

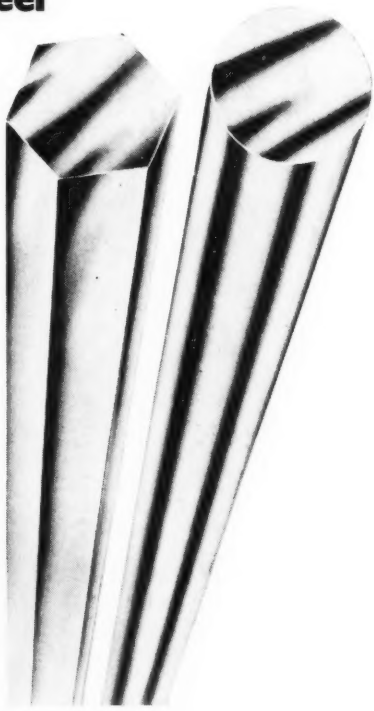
STEEL STOCKHOLDER SERVICE

Leadbearing freecutting bright steel

B.S. 970 1955 En. 1.A.

The addition of 0·15—0·35% lead alloyed to Usaspead freecutting steel, produces USALED, a leadbearing, freecutting bright steel specially for use with automatic lathes. Cutting speeds can be increased by up to 25% more than normal freecutting steel, and output can be increased by an amount equal to a working day per week.





MACREADY'S

SUPERLED

Leadbearing freecutting bright steel

B.S. 970 1955 En. 1.B.

The newest addition to the Macready range of freecutting steels has a higher machinability index than any other analysis of steel, and its use on modern automatics produces parts which previously could only be machined economically from brass.

Full descriptive literature is available on request.

A complete range of steels to B.S. 970 : 1955 (En Series) is available.

Produced specifically for capstans and autos

14th ENGINEERING EXHIBITION 1961

ROYAL HORTICULTURAL SOCIETY'S NEW HALL LONDON SW1 17·18·19 OCTOBER 1961

ENGINEERING INDUSTRIES ASSOCIATION

MACREADY'S
METAL COMPANY LIMITED
USASPEAD CORNER,
PENTONVILLE ROAD, LONDON, N.1.

Telephone: TERminus 7060 and 7030 (30 lines)

Telegrams: Usaspead, London, Telex. *Telex No. 22788.*

DONAU

High Speed

RADIAL DRILLING MACHINES

★ EASY OPERATION FOR UNSURPASSED PRODUCTIVE CAPACITY ON SHORT OR LONG RUNS.

★ FINGER-LIGHT MOVEMENT OF DRILLING HEAD.

★ CONTROLS CENTRALISED FOR MINIMUM OPERATOR FATIGUE.

★ GENEROUSLY PROPORTIONED WORK-TABLE FOR MULTIPLE FIXTURES OR LARGE COMPONENTS.

MODEL DB 25 AVAILABLE IN FOUR BASIC TYPES

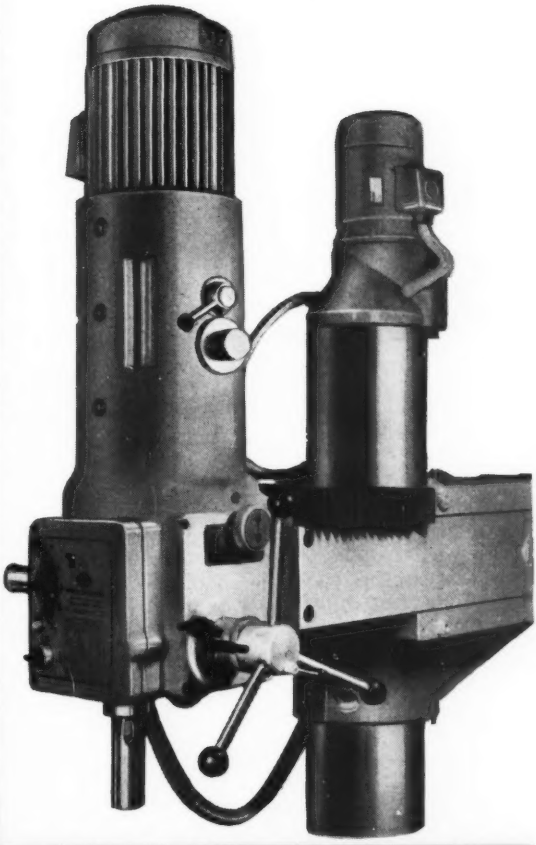
(A) Drilling head **without** electro-mechanical feed **without** tapping mechanism

(B) Drilling head **with** electro-mechanical feed **without** tapping mechanism

(C) Drilling head **without** electro-mechanical feed **with** tapping mechanism

(D) Drilling head **with** electro-mechanical feed **with** tapping mechanism

CAPACITY Drilling up to 30mm.—1 $\frac{3}{16}$in.
Tapping up to M18 $\frac{11}{16}$in. M24 $\frac{15}{16}$in.



SOLE DISTRIBUTORS FOR THE U.K.

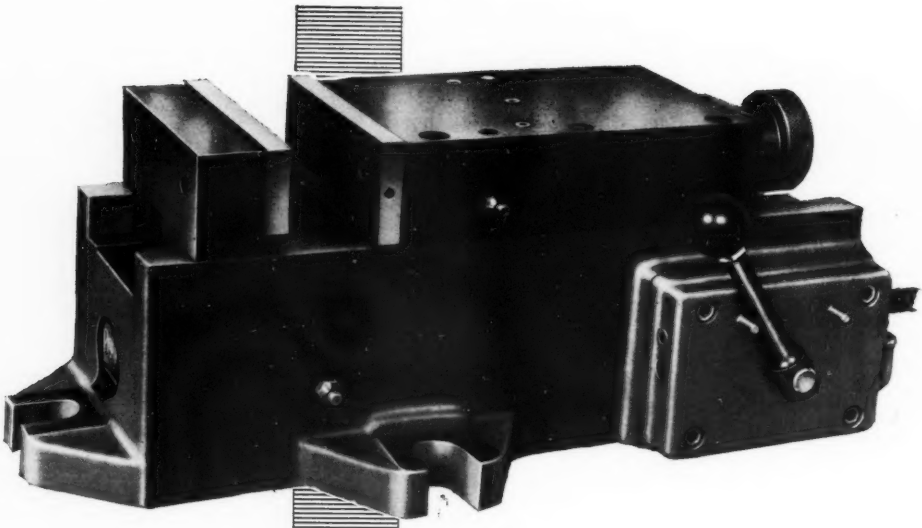
WRIGHT ELECTRIC MOTORS (HALIFAX) LTD.

MANUFACTURING ELECTRICAL AND MECHANICAL ENGINEERS

Established 1900

Branch Works : Elland Lane, Elland Yorkshire Phone 2526

H2



The PRATT

PNEUMATIC MACHINE VICE

PRINCIPAL DIMENSIONS

Width of Jaw	4⅛"	6"
Depth of Jaw	1⅜"	1⅞"
Maximum Opening	2½"	4¼"
Minimum Opening	0"	1¾"
Power Movement	⅛"	⅛"
Gripping Force at 80 P.S.I.	4,800 lbs	7,700 lbs
Length Overall	15½"	19¼"
Width Overall	7½"	9½"
Height Overall	5¼"	6⅛"
Weight (approx.)	54 lbs	126 lbs

RAPID OPERATION

HIGH GRIPPING POWER

NO OPERATOR FATIGUE

ROBUST CONSTRUCTION

AMPLE BEARING SURFACES

FOR INCREASED PRODUCTION

F. PRATT & CO. LTD. HALIFAX ENGLAND

Famous for Workholding for 100 Years

500 every hour

pendulum milled on the

CENTEC 'AUTOMIL'

WITH HYDRO-PNEUMATIC TABLE DRIVE

- **LOADING TIME ELIMINATED**
- **14" TRAVERSE**
- **FAST TRAVERSE 420" PER MINUTE**
- **WORKS ON STANDARD AIR LINE PRESSURE**
- **GIVES AUTOMATIC CYCLE PRODUCTION MILLING**
- **PENDULUM MILLING INVOLVING CONVENTIONAL AND CLIMB MILLING**

At Hollands & Blair Ltd., Croydon, components for the FARVALUBE personal weighing machine, as shown above, are produced at consistently fast rates on the CENTEC 'AUTOMIL'

The combination of hydro-pneumatic table drive, air-operated fixtures and pendulum milling cycle, ensure the lowest possible production times.

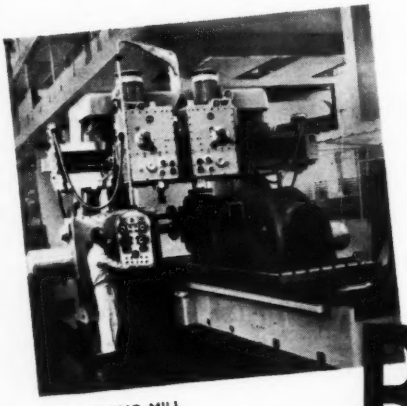
OPTIONAL EXTRAS: ● AUTO PNEUMATIC INDEXING TABLE
● VERTICAL SWIVELLING HEAD FOR MILLING AND DRILLING AT ALL ANGLES

Write for 'AUTOMIL' times on your own work

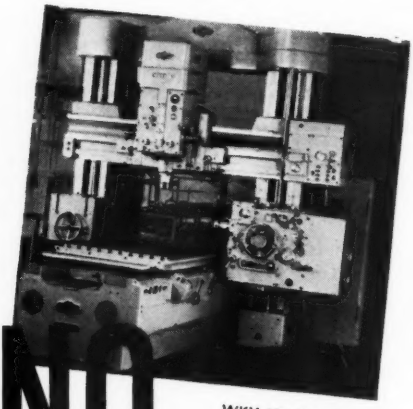
Send drawings and samples for quotation

CENTEC MACHINE TOOLS LTD., Centec Works, Hemel Hempstead, Herts. BOXMOOR 584/5/6

☆ **STAND 9215 at the EUROPEAN MACHINE TOOL BRUSSELS EXHIBITION**



FRP 12 PLANO MILL



WKV 100 JIG BORER

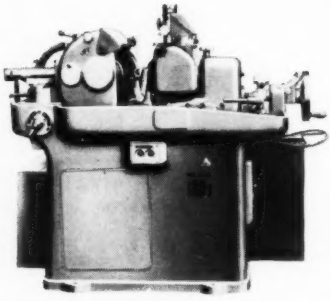
BRNO

CZECHOSLOVAKIA

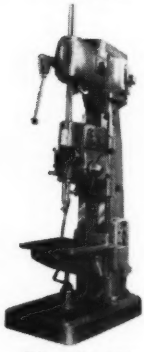
3RD ENGINEERING INTERNATIONAL FAIR

10TH TO 24TH SEPT.

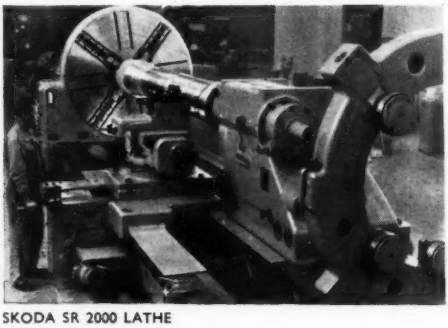
OUR REPRESENTATIVES WILL BE AT YOUR DISPOSAL DURING THE PERIOD OF THE FAIR AND WOULD BE PLEASED TO MEET YOU PERSONALLY TO DISCUSS THOSE MACHINES FOR WHICH WE ARE EXCLUSIVE AGENTS



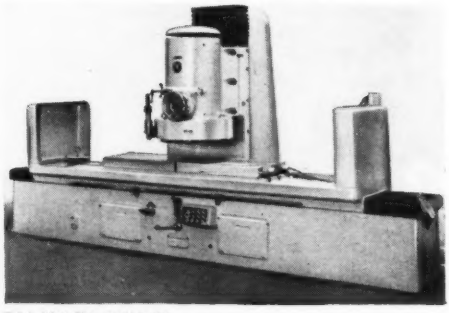
TOS BBZ 60 CENTRELESS GRINDER



TOS V50A DRILL



SKODA SR 2000 LATHE



TOS BPV 700 GRINDER

For further details of exhibits please write to :—

TIMES

THE TIMES MACHINERY CO LTD

Poyle Road · Colnbrook · Slough · Bucks

Telephone: Colnbrook 2442

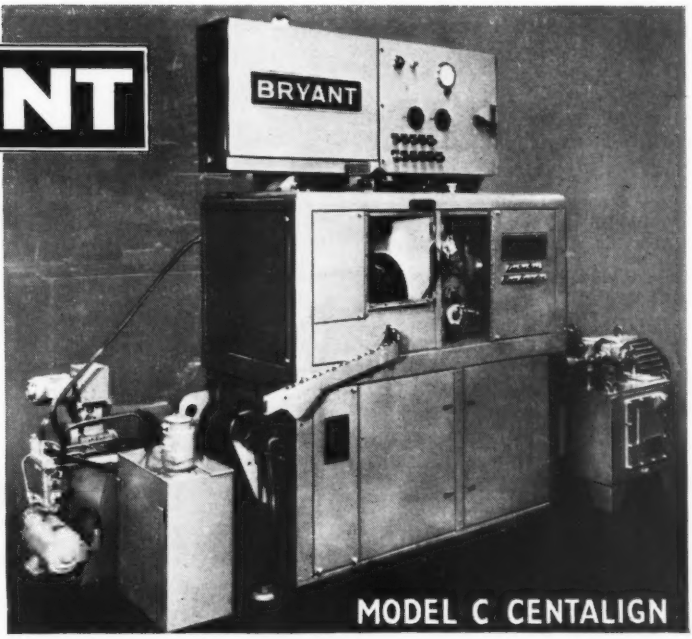
BRYANT

CENTERLESS RACE GRINDER

built by

Ex-Cell-O CORPORATION

at Leicester



The machine shown is tooled for Automatic loading when grinding tracks of outer races.

PRODUCTION DETAILS

Track diameter 1.8110"—260 hrs.

Track diameter 2.1891"—250 hrs.

Track diameter 2.5197"—250 hrs.

Surface finish on all parts 8 R.M.S.

at 100% efficiency

As Sole Agents in this Country for Bryant Machines, we will be happy to send you further details of Centalign Grinders or any other Bryant Machines in which you may be interested.

BUCK & HICKMAN LTD

MACHINE TOOL DIVISION

OTTERSPOOL WAY · WATFORD BY-PASS · WATFORD · HERTS

HEAD OFFICE

PO BOX 74 · WHITECHAPEL ROAD · LONDON E.1

BRANCHES

ALPERTON · BIRMINGHAM · BRISTOL · GLASGOW · LEEDS · MANCHESTER

When answering advertisements kindly mention MACHINERY.

DRUMMOND-ASQUITH *Machine*

We invite you to inspect the Machine Tools which will be exhibited on the Stands listed on these pages.

SNOW & CO. LTD., Sheffield, England. STAND 7502, HALL 7

SURFACE GRINDING MACHINES

A 20 inch Double Disc Grinding Machine will be exhibited and it incorporates Hopper Loading, Automatic Sizing and Automatic Ejection Equipment.

BOHLE ..... Germany
PRODUCTION MILLING MACHINES
STAND 9210 ..... **HALL 9**

DEUTSCHLAND ..... Germany
WHEEL TURNING LATHES
STAND 5009 ..... **HALL 5**

GEHRING ..... Germany
HONING MACHINES
STAND 7504 ..... **HALL 7**

H.E.B. ..... France
CENTRE LATHES & COPYING LATHES
STAND 4123 ..... **HALL 4**

JUNGENTHAL ..... Germany
VERTICAL TURNING & BORING MILLS
STAND 5303 ..... **HALL 5**

KRAUSE ..... Austria
FINE BORING MACHINES
STAND 6014 ..... **HALL 6**

LIDKOPING ..... Sweden
CENTRELESS GRINDING MACHINES
STAND 7703 ..... **HALL 7**

MANURHIN ..... France
SINGLE SPINDLE AUTOMATICS
STAND 2001 ..... **HALL 2**

M.S.O. ..... Germany
GRINDING MACHINES
STAND 7600 ..... **HALL 7**

NASSOVIA ..... Germany
DIE SINKING MACHINES
ROTARY TABLE CHUCKING AUTOMATICS
STAND 6214 ..... **HALL 6**

PETEWE ..... Germany
PROJECTION FORM GRINDING MACHINES
STAND 7701 ..... **HALL 7**

U.V.A. ..... Sweden
INTERNAL GRINDING MACHINES
STAND 7603 ..... **HALL 7**

WALDRICH COBURG .... Germany
PLANING & PLANO MILLING MACHINES
STAND 5105 ..... **HALL 5**

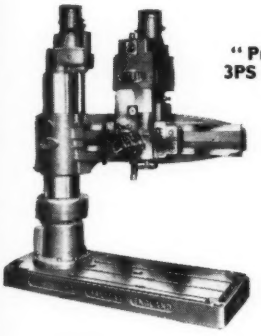
... If you cannot visit Brussels and would like more details, write for a catalogue and mention the type of machine which interests you.

Tools at BRUSSELS Sept 3rd-12th

ASQUITH MACHINE TOOL CORPORATION LTD., HALL 5 STAND 5101

6′ 0″ Radius
3PS Radial Drilling Machine

Of up-to-date design with compact grouping of controls and special form of spindle mounting for maximum rigidity when drilling or boring. 12 speeds and 6 feeds are standard. Drilling capacity from the solid in steel, 3″ continuously, 3½″ occasionally.



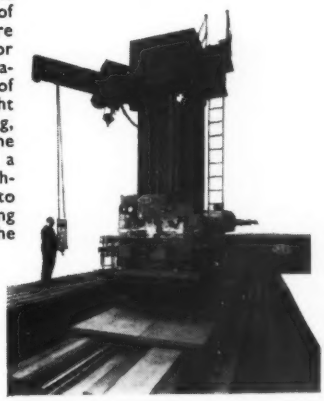
" Preselector " 8′ 0″ Radius
3PS Radial Drilling Machine

This machine is equipped with Pre-selection of feeds and speeds giving silent, foolproof gear change which can be pre-selected whether the spindle is running or not. The change is effected when the spindle is running, by operation of a push button.

6″ Spindle Ram Type
Horizontal Milling & Boring Machine

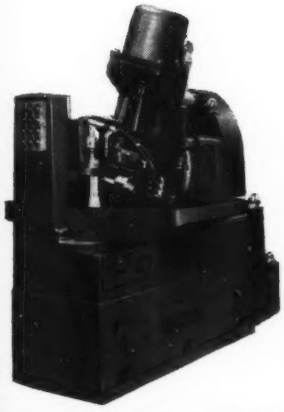
The Asquith Ram Type machine is designed for exceptional versatility of operation on large workpieces at one setting of the component. The robust proportions of the machine ensure adequate rigidity for heavy milling operations. A wide range of attachments for right angle milling, boring, etc., can be fitted at the front of the ram and a surfacing slide attachment when bolted to the flange of the milling sleeve has all the features of a built-in facing head.

The Asquith Ram Type is built in a range with spindle diameter up to 11 in.



DRUMMOND *HOBlique*

Gear Hobbing Machine with Automatic Loading and Unloading



The 12″ HOBlique machine is being demonstrated set up for the completely automatic cutting of one of the gears on a tractor layshaft cluster gear. It is equipped with swinging arm loading mechanism and operates on a fully automatic cycle.

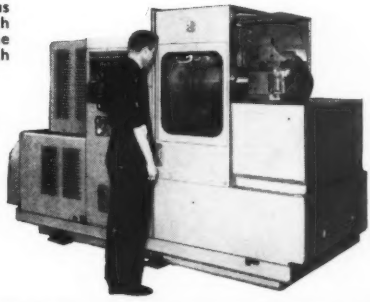
This compactly designed machine has a vertical work axis and the hob slide moves through the oblique plane when cutting helical gears. It is an ideal machine for high speed, heavy feed, mass production of transmission gears.

WARNER SWASEY ASQUITH 2AC

Single Spindle Chucking Automatic

The 2AC is an accurate high-production machine with quick set-up features that make it economical for operation on a variety of work required in medium quantities. Two cross slides feed tools at 90° to the spindle axis and a 5 station main slide operates parallel to the spindle. These slides can operate in various combinations with each other. The 2AC is fitted with a 12 in. chuck.

British Built



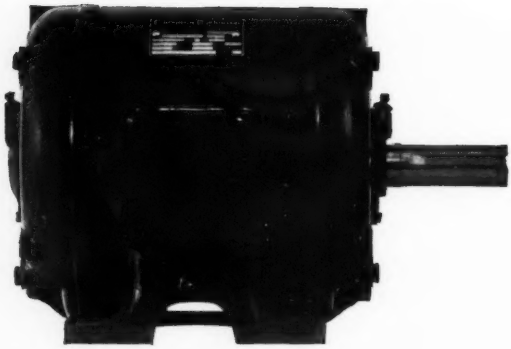
Sales and Service for the British Isles

DRUMMOND - ASQUITH LIMITED

Member of the Asquith Machine Tool Corporation

KING EDWARD HOUSE, NEW ST., BIRMINGHAM. Phone: Midland 3431. Also at LONDON Phone: Trafalgar 7224 & GLASGOW Phone: Central 0922

IF 501



You can usually divide the designing of any piece of equipment into two parts. The first—mainly theoretical—determining the basis of performance; the second—mainly practical—concerned with how the thing shall be made. Whereas the first proceeds from well-established principles held in common by all engineers, the second draws largely on the experience which has been accumulated over the years by a single manufacturer: his know-how. It is usually on this second aspect of design that the differences between one manufacturer's product and another's depends.

This thing called know-how

An interesting feature common to both ventilated (C range) and T.E.F.C. (D range) motors is the mounting of the stator pack. This is fully wound, impregnated and stoved. The stoving polymerises the varnish, making the winding highly resistant to oil, grease, humidity, salt spray and water. The stator pack, now a rigid unit, is pressed into the stator frame and located. This method of manufacture enables us to build a wide range of motors from stock parts and is one reason why we can quote good deliveries and *stick to them.*

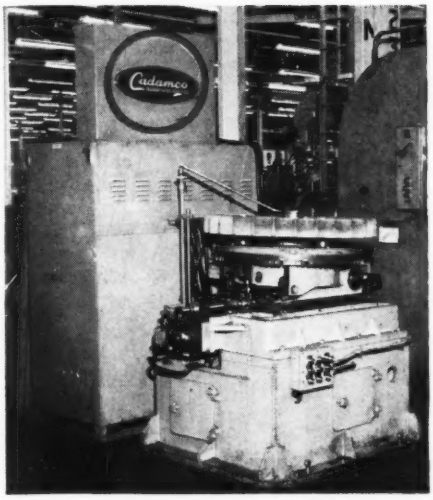
Crompton Parkinson LIMITED

ELECTRICAL EQUIPMENT

Makers of Electric Motors of all kinds, A.C. and D.C. Generators, B.E.T. Transformers, Switchgear, Cables, Instruments, Lamps, Lighting Equipment, Batteries, Stud Welding Equipment, Traction Equipment, Ceiling Fans.

CROMPTON PARKINSON LTD · CROMPTON HOUSE · ALDWYCH · LONDON · WC2

G613



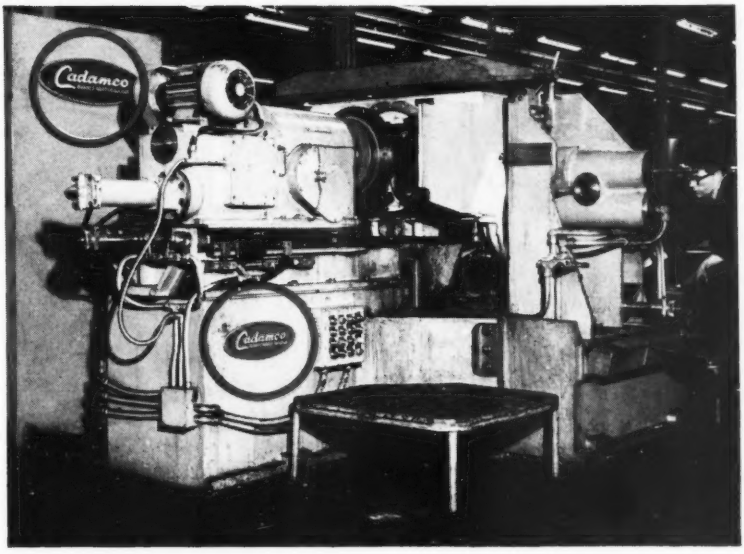
Cadamco

The mark of leadership in the design and manufacture of modern special purpose machines

These pictures from the production line of Caterpillar Tractor Company Limited are proof positive of our ability to provide the right design and a high standard of manufacture. If your machinery problems demand an 'out-of-the-rut' approach you will find us keen to help you find the solution at a competitive price.

Automatic spline shaping machine
Produces eighty tapered splines by fully automatic cycle.

Heavy duty boring machine
Completes four bores and facing of a tractor steering case on a semi-automatic cycle.



CYRIL ADAMS & CO. LTD.,

155 East Barnet Road, New Barnet, Herts. Telephone: Barnet 2335/6/7

Designers and Manufacturers of Jigs, Fixtures and Special Purpose Machine Tools.

Member of the Staveley Industries Limited Group of Companies

Member of the Machine Tool Trades Association.

Recommended VERALOY GRADES FOR CUTTING APPLICATIONS

MATERIAL TO BE MACHINED	TYPE OF OPERATION			
	Roughing and Intermittent Cutting	General Purpose	Finishing	Precision Boring
ALUMINIUM LIGHT ALLOYS	V	V	V	V
COPPER BRASS · BRONZE	U or B1	B1	V	V
ORDINARY CAST IRON	U	U or B1	V	V
CHILLED IRON ROLLS STEEL ROLLS	B1	B1	V	V
MEEHANITE 'BEST QUALITY' CAST IRON CLOSE GRAIN C.I. ALLOY CAST IRON	U or VL.23	B1 or VL.23	V or VL.12	V or VL.12
STEEL	VL.45	VL.23	VL.12	VL.12
STAINLESS AND 'NIMONICS	U	U or V	V	V

This is to be taken as a guide only. Final decision on best grade selection can often only be taken after comparative tests, as the many factors which can influence the performance are not always apparent.

Further Information, Consult:—

VERALOY

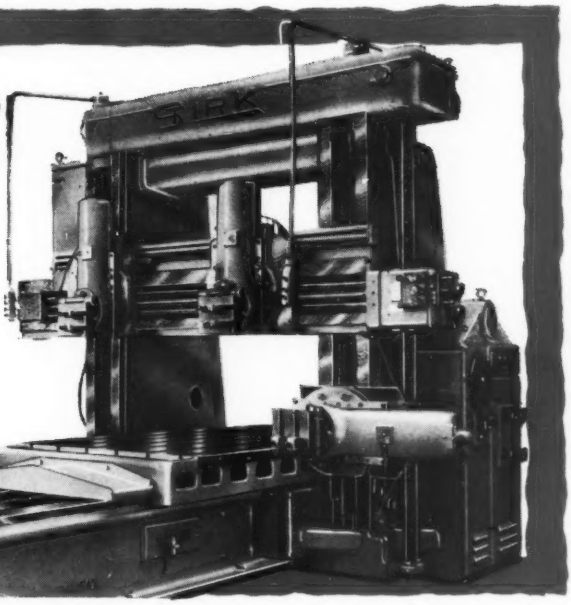
VERALOY PRODUCTS LIMITED

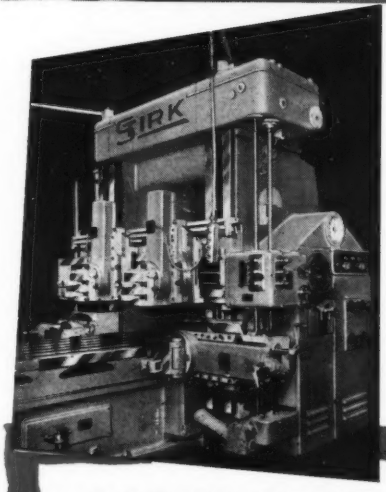
BEECH ROAD · THE MARSH · HIGH WYCOMBE · BUCKINGHAMSHIRE

Telephone: High Wycombe 2795/8 · Telegrams: Veraloy High Wycombe

STIRK

PLANERS SET THE STANDARD





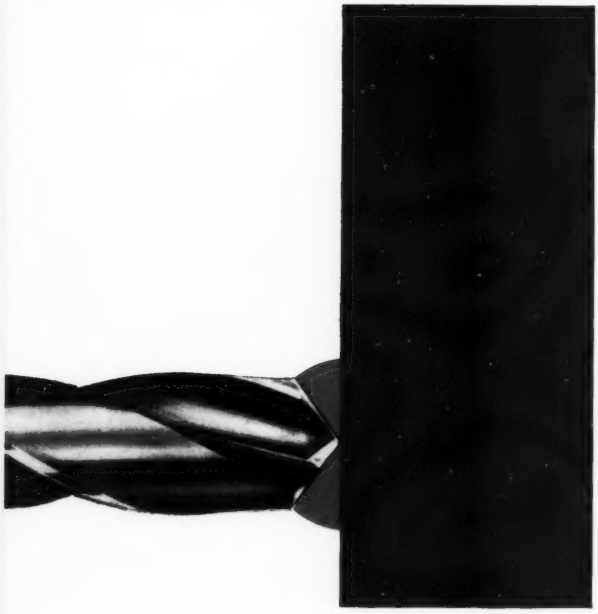
The modern Stirk Planer, with built-in electrical equipment, possesses many distinctive features which make it one of the world's finest planing machines.
The easy control and fine accuracy of the modern planing machine is due in no small measure to the continuous development of Stirk Planers. For more than fifty years Stirk Planers have influenced the design and set the standard by which others are judged.

JOHN STIRK & SONS LIMITED

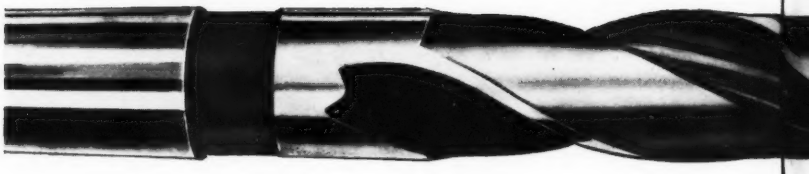
HALIFAX - ENGLAND

OVERSEAS AGENTS.—

AUSTRALIA: Gilbert Lodge & Co. Ltd., 386, Harris Street, Ultimo, Sydney, N.S.W. CANADA: Williams & Wilson Ltd., 544, Inspector Street, Montreal. FRANCE: Societe Anonyme Alfred Herbert, 1 and 3, Rue du Delta, Paris (9^{e}). HOLLAND: Esmeijer & Co., Oosterkade 24, Rotterdam C. INDIA: Alfred Herbert (India) Ltd., 13/3, Strand Road, P.O.B. 681, Calcutta 1. NEW ZEALAND: Gilbert Lodge & Co. Ltd., Head office: 55, Station Road, P.O. Box 12-063, Penrose, Auckland, S.E.6. N.Z., also at Christchurch and Wellington. PAKISTAN: Guest, Keen & Nettlefolds in Pakistan Ltd., P.O.B. 819, Bank of India Buildings (3rd Floor), Bunder Road, Karachi. SPAIN: Gumuzio S.A. Gran Via 48, Apartado 920, Bilbao. KENYA, UGANDA, TANGANYIKA & ZANZIBAR: Len Cooper Ltd., P.O.B. 3796, Nairobi, Kenya. SWEDEN: Aktiebolegat Servus, Malmskillnadsgatan 46, Stockholm.

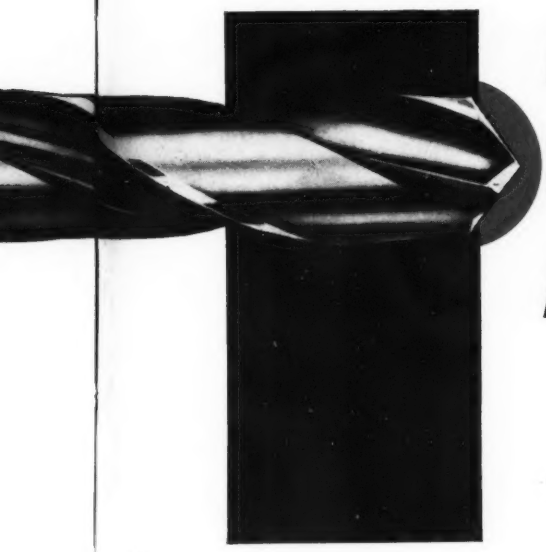


the quickest



$\frac{31}{32}$" dia. SPEEDICUT "CHIPBREAKER" Drill on black steel plate 2" thick at a speed of 110 ft. per minute with ·020" feed. Previously the best conditions were, speed 80/90 ft. feed ·010" — the "Chipbreaker" drill has reduced drilling time by half.

st distance



between two points

SPEEDICUT

"CHIPBREAKER" DRILL

FIRTH BROWN TOOLS LTD

SPEEDICUT WORKS · CARLISLE ST. EAST · SHEFFIELD

KEARNS at BRUSSELS

YOU ARE INVITED TO SEE THESE OUTSTANDING MACHINES IN OPERATION...

stand no. 6015/hall 6

7th EUROPEAN MACHINE TOOL EXHIBITION
BRUSSELS
SEPT. 3rd-12th 1961

Favourable delivery dates

Pioneers of horizontal boring machines with electronic co-ordinate setting.
We will be pleased to send you fully descriptive catalogues on any of our machines.

*** OPTIMETRIC HIGH SPEED HORIZONTAL TOOL-ROOM BORING MACHINE, 'S' TYPE SPINDLE MODEL.**

A new machine for the production of precision components requiring bores to a high degree of finish. Infinitely variable spindle speeds and table feeds.

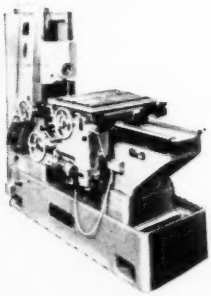
*** OPTIMETRIC HORIZONTAL TOOL-ROOM SURFACING, BORING, MILLING, DRILLING AND TAPPING MACHINE, MODEL 721 P—with PATENT TOOL HOLDING DEVICE.**

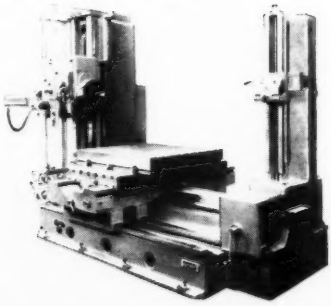
An entirely new model with our patented twin spiral facing chuck and bed. Built on unit construction principle enabling the machine to be offered with the most suitable capacity at minimum capital cost.

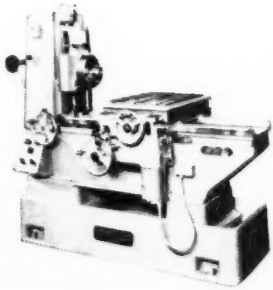
'S' Type HORIZONTAL SURFACING AND BORING MACHINE, FACING CHUCK MODEL

The ideal medium for training student engineers—this model has been installed in over 100 Technical Schools and Colleges throughout the world.

* *Registered Trade Mark*

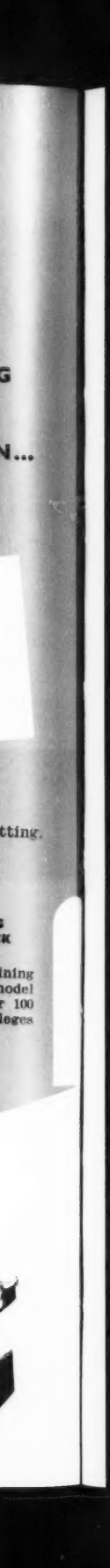






H. W. KEARNS & CO LIMITED BROADHEATH near MANCHESTER ENGLAND

Telephone: ALTrincham 3284 Telegrams: KEARNS Altrincham Telex: 66399



SAVE wear and you **SAVE** money

invest in quality

use BP

ENERGOL

INDUSTRIAL LUBRICANTS

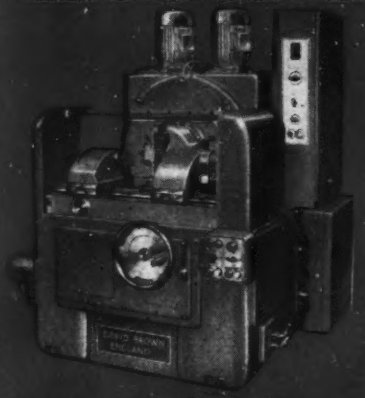
Distributed by

THE POWER PETROLEUM COMPANY LTD

76-86 STRAND · LONDON W.C.2 *(Branches and Depots throughout the country)*

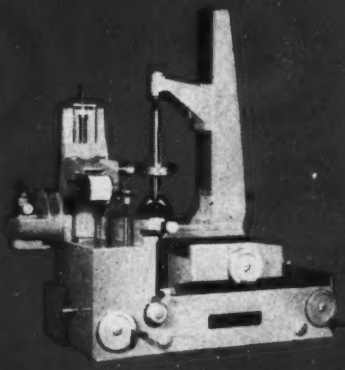
THE
BIG
PEOPLE
for
MACHINE TOOL
REBUILDING
are....
Newman
OVER A QUARTER OF A CENTURY'S EXPERIENCE
NEWMAN INDUSTRIES LIMITED
YATE · BRISTOL · ENGLAND
Telephone: Chipping Sodbury 3311

David Brown MACHINES



. . . with
David Brown CUTTERS

. . . with David Brown
MEASURING EQUIPMENT



. . . for best results!

Co-ordinated equipment for maximum efficiency on gear shaving

All your gear shaving and testing equipment from one organisation. The perfect relationship in design and performance, giving peak efficiency at every stage. That's the ideal for best results. And that's what you get when you buy David Brown gear shaving and measuring equipment. David Brown are ready to prove it!

DAVID BROWN

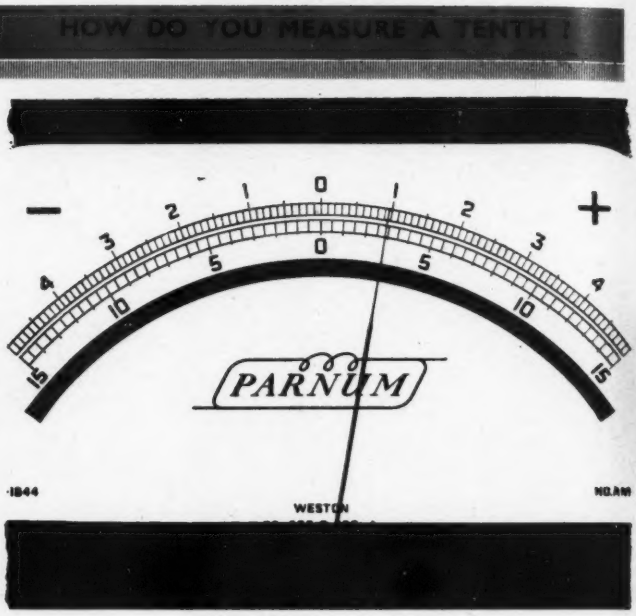
100 YEARS SERVING INDUSTRY 1860-1960

THE DAVID BROWN CORPORATION (SALES) LTD.

MACHINE TOOL DIVISION, ASHBURTON ROAD,
TRAFFORD PARK, MANCHESTER 17.
Telephone: TRAFFORD PARK 4741.

TOOL DIVISION, PARK WORKS,
HUDDERSFIELD.
Telephone: HUDDERSFIELD 3500.

OA/6/09



Gauge scale—actual size

. . . the drawings call for 'tenth' tolerances. Your customer says the parts are wrong. You have a heap of rejects. How do you prove who's right?

Look at the scale above. It is the measuring scale incoporated in all PARNUM gauging equipment. The tenths are easy to read, aren't they? But more than that—*they repeat.* Not to just a tenth—to a hundredth, .00001in. No customer—or anyone else—can tell you you're wrong if PARNUM equipment says you're right.

Whatever your gauging problem, some unit in the PARNUM range will solve it.

STANDARD GAUGE COMPLETE WITH PROBE £80

Please send for further information to

PARNUM GAUGES LTD., BRACKNELL. BERKS
Bracknell 1831

ACCURATELY YOURS—

PARNUM GAUGING EQUIPMENT

Rotary Burs are available in a wide variety of shapes and cuts. These burs can be supplied as carbide, high-speed steel or special carbon steel and when correctly handled will give extended tool life with fast stock removal.

Burs are stocked with shank diameters to suit general industrial requirements, also inserted shank burs are available.

Rotary files, rasps and key cutting files are also available.

BURFLEX

ROTARY BURS

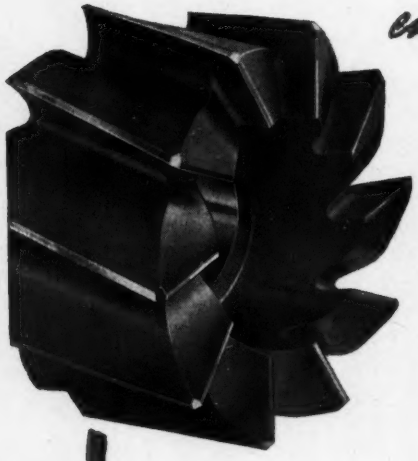
to meet your every need

ALFRED HERBERT LTD COVENTRY

AD 653

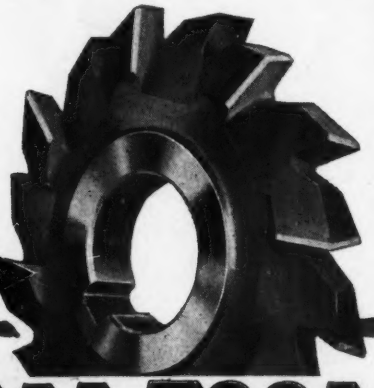
QUALITY *plus* PRECISION

ensures higher production!



more and more
satisfied customers
are profiting by
MOORE'S continuing
search for better ways
of cutting metal
. . . *are you?*

MOORE MANUFACTURING COMPANY LTD.
PROGRESS WORKS, LAISTERDYKE, BRADFORD, 4.
PHONE: BRADFORD 64365/6/7 GRAMS: MOORANCO, BRADFORD



MOORE

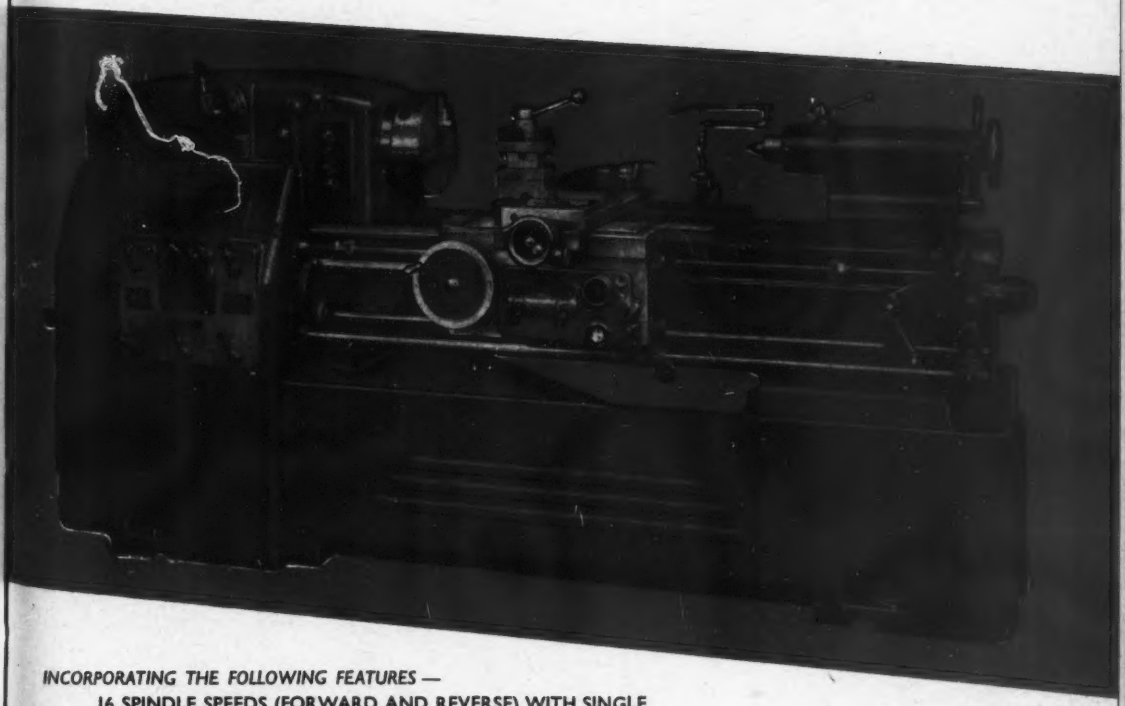
SMALL TOOLS

MILLING CUTTERS OF ALL TYPES • REAMERS • SLITTING SAWS • TWIST DRILLS • ARBORS • SLEEVES • SOCKETS • LATHE CENTRES
Our Complete Catalogue will be sent on request

When answering advertisements kindly mention MACHINERY.

Introducing the NEW

MODEL 'H' No. 17 PRECISION LATHE



INCORPORATING THE FOLLOWING FEATURES —

16 SPINDLE SPEEDS (FORWARD AND REVERSE) WITH SINGLE LEVER CONTROL.
CAM-LOCK SPINDLE NOSE, 2⅜" DIA. HOLE.
SINGLE HELICAL GROUND GEAR, FINAL DRIVE.
TOTALLY ENCLOSED GEARBOX AND APRON.
60 DIRECT CHANGES OF THREADS AND FEEDS.
PRECISION LEADSCREW AND COMPENSATED THRUST.

ALSO AVAILABLE —

ALTERNATIVE SPEED RANGE, BED LENGTH, RAPID POWER TRAVERSE, TWO-SPEED TAILSTOCK.

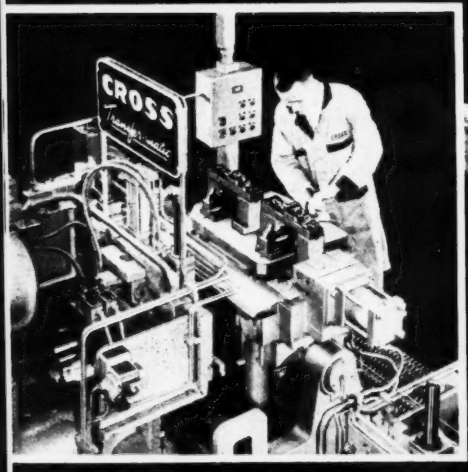
STANDARD MODEL
20" SWING OVER BED
42" BETWEEN CENTRES
SPINDLE SPEEDS 15-1000 R.P.M.

HYDRAULIC PROFILING EQUIPMENT
TAPERING EQUIPMENT ETC.

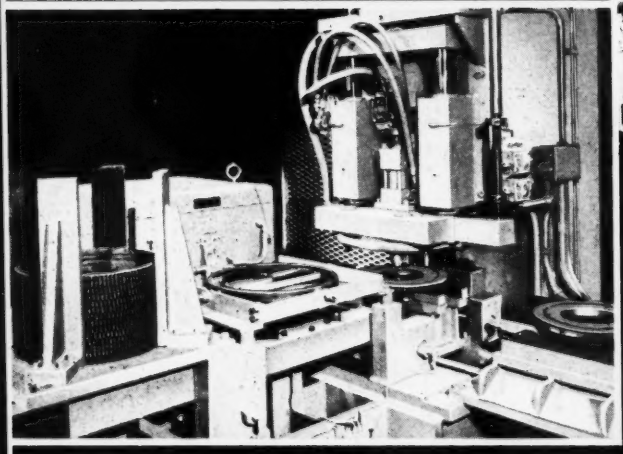
Telephone :
HARLOW 2351

HOLBROOK MACHINE TOOL CO. LTD.

CAMBRIDGE ROAD, HARLOW, ESSEX



In Section I, tool slide units pivot to a convenient position for ready access to cutting tools.



The ring gears, stacked at the left, are heated in an induction coil in the center, pressed on the flywheel at the right and shrunk in position by a cold air blast.

Another Automation First by Cross

Transfer-matic Completely Processes Flywheels and Assembles Ring Gears

Machining Operations Include Facing, Turning, Boring, Chamfering, Drilling and Tapping

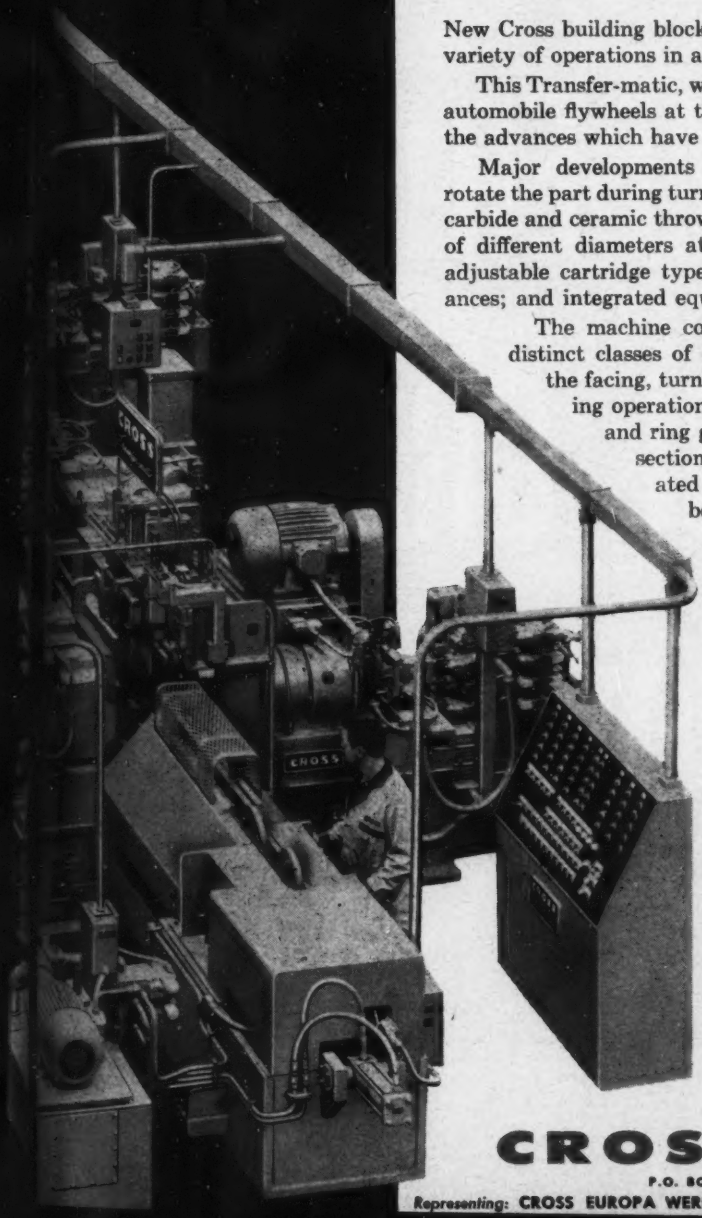
New Cross building blocks make it possible to complete a wide variety of operations in addition to drilling and boring.

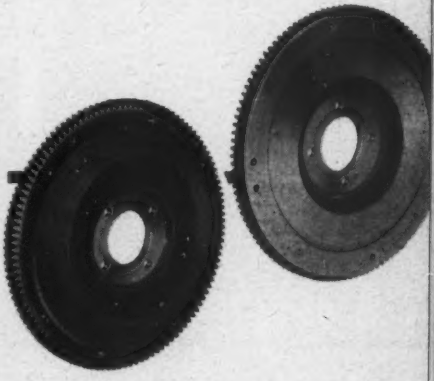
This Transfer-matic, which completely processes two different automobile flywheels at the rate of 132 per hour, is evidence of the advances which have been made.

Major developments include standard chucking units to rotate the part during turning, facing, and boring; the use of both carbide and ceramic throw-away inserts to assure proper cutting of different diameters at a single spindle speed; individually adjustable cartridge type tool holders to maintain close tolerances; and integrated equipment to assemble the ring gear.

The machine consists of two sections to handle two distinct classes of operations. The first section performs the facing, turning, boring, undercutting and chamfering operations. Drilling, reaming, tapping, cleaning and ring gear assembly take place in the second section. The two sections are normally operated as one machine. A banking station between sections permits either to continue when the other is stopped for tool changes.

Quick changeover for the two flywheel designs is achieved by such features as the use of eccentric spindles to machine different hole patterns.





CROSS INTERNATIONAL A.G.

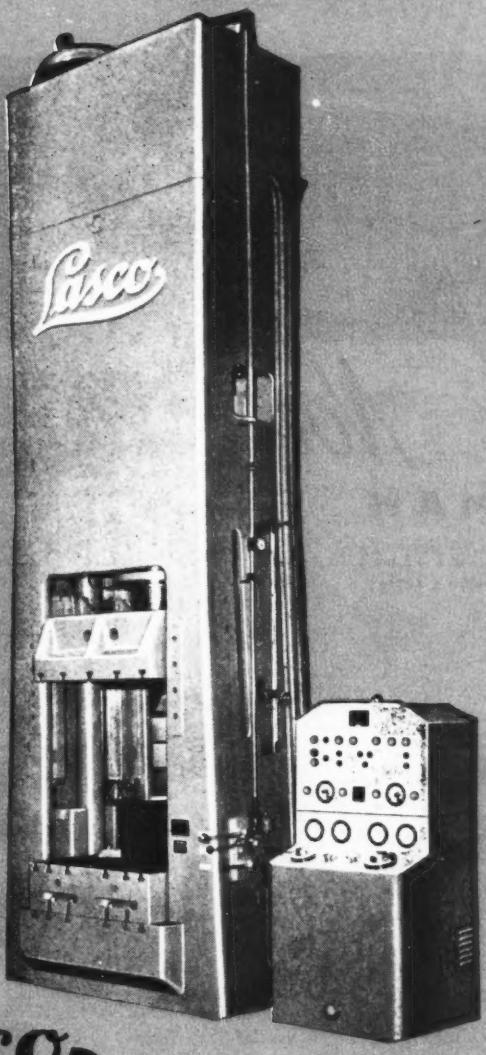
P.O. BOX 300 · FRIBOURG, SWITZERLAND

Representing: CROSS EUROPA WERK GmbH., GERMANY · THE CROSS COMPANY, U.S

REMEMBER!

IT'S PAUL GRANBY

FOR—



Lasco Electro-Hydraulic Hammer Presses

PG

PAUL GRANBY & CO. LTD.

39 VICTORIA STREET · WESTMINSTER · LONDON · S W 1

Telephone: ABBEY 5338 Telegrams: POWAFORGE, SOWEST, LONDON Cables: POWAFORGE, LONDON

Now

REDMAN

UNITOOL SYSTEM

Patent Nos. 639079 & 647163

TRANSFER PRODUCTION ON ANY PRESS OR PRESS BRAKE WITH LOW COST !

Standard UNiPIERCE and UNiCROP Units cut the cost of tooling and get you into production faster.

At a fraction of the usual cost our standardised units make possible multi-operation transfer work on all types of Presses and Press Brakes. Full details and technical help without obligation. Catalogue UP/1002/M4 on request.

REDMAN TOOLS & PRODUCTS LTD.

Box. No. M.4. Gregory's Bank, Worcester.

Tel : Worcester 26933 (4 lines) 'Grams : Redtools, Worcester. Northern Agents : Dunmac Ltd., 123 Hope Street, Glasgow C.2. Tel : Central 0421/2.

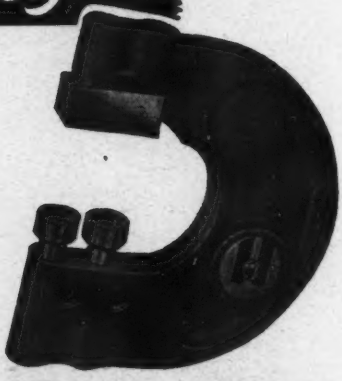
say Yorkshire precisely —

YPG

ADJUSTABLE PLAIN CALIPER GAUGES

These adjustable plain caliper gauges are available in four types. All anvils are accurately lapped flat and parrallel in hardened steel or tungsten carbide.

. . . PLUG GAUGES too



Also available is our extensive range of plug gauges. The double ended type shown is carried in an anodised aluminium handle with red/green colour coded ends.

Write for price lists.

TYPE E: Knife Edge adjustable anvils for undercuts, etc. Range 0-1¼" dia.

Type B: Four-pin Headed adjustable anvils. Range C-1¼" dia.

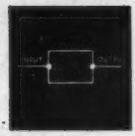
TYPE C: Two-pin Headed adjustable anvils and fixed block anvil. Range 0-1⅛" dia.

Type A: Four-pin Headless adjustable anvils. Range 0-36" dia.

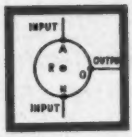
YORKSHIRE PRECISION GAUGES LTD.

HATFIELD : Nr. DONCASTER : YORKS

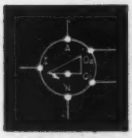
Telephone: STAINFORTH 543



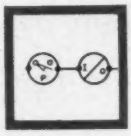
How does



the BI-Stat system



- SWITCH WITHOUT CONTACTS?
- SWITCH WITHOUT MAINTENANCE?
- SWITCH AND SWITCH AND GO ON SWITCHING?



- The BI-Stat system relies on the static switching properties of modern, miniaturised devices such as semiconductors. Its components are standard encapsulated blocks which are not just on-off devices but logic units and amplifiers which combine, sort and magnify input signals. Combinations of these units can perform all the functions of any relay system, however complex and sophisticated.
- BI-Stat has none of the accepted limitations of electro-mechanical relay systems because there are no moving parts and no contacts. Burn-outs, corrosion, maladjustment, wear, sticking, fouling, fatigue—all these are unknown to BI-Stat. BI-Stat needs no maintenance.
- No contacts, no moving parts, no maintenance, total encapsulation—short of considerable mechanical shock and intense heat, there's nothing that can disturb BI-Stat.

BI-Stat is supplied as BHI-engineered equipment, or as components for your own systems.

BI-Stat is finding success in widely varying motor-control schemes. Have you a complex process in mind? Would stoppages be costly? Would maintenance be extensive?

- Write for publication ZB35 and consult BHI for the BI-Stat answer to your problems. BI-Stat will solve them permanently.

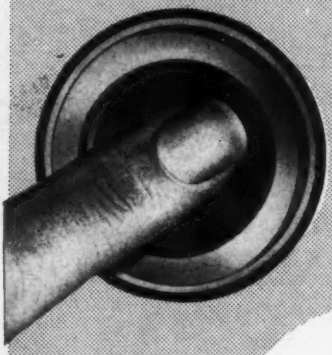
BHI
Metal Industries Group

BROOKHIRST IGRANIC

Enquiries to:
BI-STAT DIVISION · NORTHGATE WORKS · CHESTER
MAKERS OF BRITAIN'S WIDEST RANGE OF ELECTRICAL CONTROLS AND ASSOCIATED EQUIPMENT
BI/59

When answering advertisements kindly mention MACHINERY.

START...NEW efficiency



ensure velvet-smooth starting, stopping positioning and tensioning

achieve complete electrical integration of machine drives and controls

eliminate complex equipment

lessen operator fatigue

widen scope for machine design

INSTALL THESE COMPACT SPACE-SAVING UNITS

WARNER

Electric Brakes and Clutches

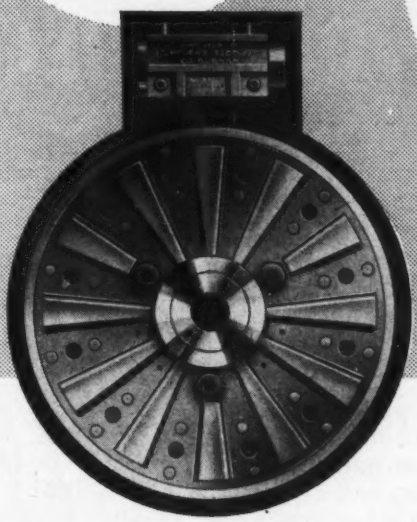
MORE CONTROL—MORE PRODUCTION

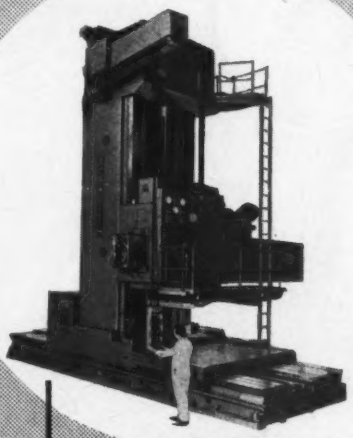
Warner *Electric* Brakes and Clutches completely integrate power transmission with electrical or electronic machine control circuits. Electric Brake units eliminate coasting, save non-productive machine time; electric clutches operate rapidly in any position and give smooth engagement. Warner electric units are easily installed—on new or old-type machines. Their superior performance is directly responsible for greater production in many varied industries—very probably in yours!

Write for illustrated Warner brochure

# of machine control

reduce
brake and clutch maintenance and reduce servicing of actuated devices





This Asquith Ram Type Horizontal Milling & Boring Machine, with 6" dia. spindle, incorporates Warner Clutches for speed change of the feed drive.

Reproduced by courtesy of William Asquith Ltd., Halifax.

WESTOOL LIMITED

ST. HELEN'S AUCKLAND CO. DURHAM

Telephone: West Auckland 551 (6 lines)
Telegrams: Solenoid, West Auckland

LONDON:
2 Ashley Place, Carlisle Place, London, S.W.1
Telephone: VICtoria 7301/2

BIRMINGHAM:
Silhill Hse., 2241 Coventry Rd., Sheldon, Birmingham 26
Telephone: SHEldon 5121/2

Other well-known users of Warner Electric Brake & Clutches include:

BROOKE TOOL AUTOMATION LTD
B.S.A. TOOLS LTD
CHURCHILL-REDMAN LTD
CHURCHILL GEAR MACHINES LTD
CRAVEN BROTHERS (MANCHESTER LTD
DAVID BROWN INDUSTRIES LTD
(Machine Tool Division)
ELLIOTT BROTHERS (LONDON) LTD
GEORGE RICHARDS & CO. LTD
HARDINGE MACHINE TOOLS CO. LTD
ALFRED HERBERT LTD
HUMPHRIS & SONS LTD
B. O. MORRIS LTD ('MORRISFLEX')
A. B. MOULD CONSTRUCTION CO. LTD
PLATT BROS (SALES) LTD
TWEEDALES & SMALLEY LTD
VICTORY KIDDER PRINTING MACHINE CO. LTD
WINGET LTD

The most *Accurate* Dial Cylinder Gauges are JOHN BULL

SOUND DESIGN PLUS
'JOHN BULL' CRAFTSMANSHIP

EXCLUSIVE FEATURES

* Unit construction
* Balanced centralisers
* Close-to-shoulder checking in blind bores
* Tungsten carbide tips standard on types SBX, SBY, SBZ and available throughout range

Send for catalogue

Five models available covering all sizes from ½" to 12" diameter

BI BRITISH INDICATORS (SALES) LIMITED
SUTTON ROAD · ST. ALBANS · HERTS
Telephone: ST. ALBANS 52267/8

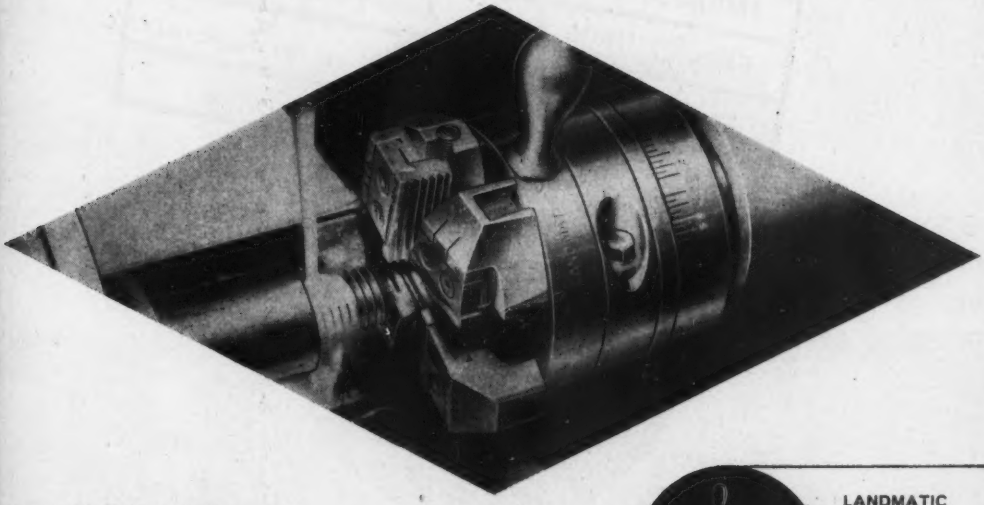
6, 1961

D

INTRODUCING *Genuine*

LANDIS

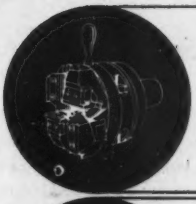
BRITISH MADE **DIEHEADS**



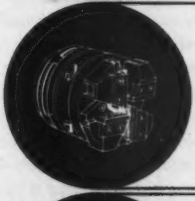
Write for illustrated leaflet LMA 60, covering Landis British built heads.

Landis heat treated dieheads using genuine Landis precision ground tangential chasers combine to ensure lowest operating costs.

- Wide Range coverage
- Close to shoulder threading
- Exceptional chaser life
- Free chip clearance



LANDMATIC
A stationary diehead for capstan and turret lathes, also screw machines employing a stationary diehead.



LANCO
A revolving diehead for hand operated semi-automatic and automatic threading machines.

LANDEX
A revolving diehead for application to automatic screw machines and other types of machines employing a 'live' spindle.

LANDIS MACHINE-MAIDEN LTD

HYDE · CHESHIRE · ENGLAND

A subsidiary of LANDIS *Machine* COMPANY U.S.A.

SM/MA 6391

Sparking time: 1 hour 55 mins

THIS MEDAL DIE took 1 hour 55 minutes to make on the new GKN Spark Machine, Model B2. How long would it have taken by other methods?

When you've worked it out, consider the GKN Spark Machine. *It is faster, more accurate, more versatile, more compact and better designed than any other machine of its kind,* yet both installation and running costs are low.

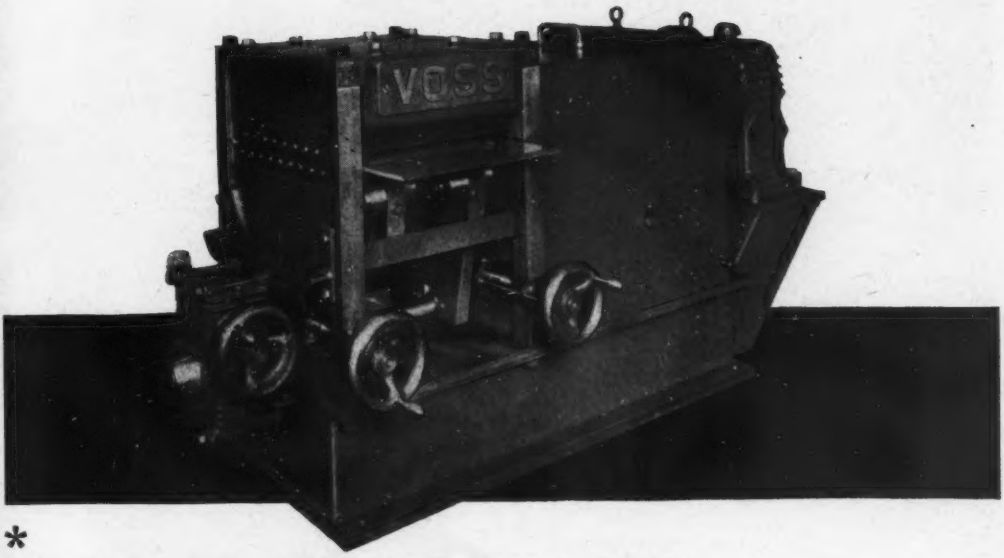
The GKN Spark Machine was designed by the GKN Group Research Laboratory. Not only is it backed by all the Laboratory's technical resources, but *every user of the GKN Spark Machine can count on regular visits from the makers' Technical Representative to ensure that he gets the most from his machine.*

Whether you are engaged in forging, wire-drawing or press-tool making, the GKN Spark Machine is something it will pay you to know about. Ask our sales agents for an illustrated brochure on the GKN Spark Machine (Models B1 & B2). Ask them now.

The GKN Spark Machine
DESIGNED BY THE GKN GROUP RESEARCH LABORATORY

WELSH METAL INDUSTRIES LTD.,
Caerphilly, Glamorganshire.
Sales Agents U.K.
M. C. Layton Limited, Abbey Wharf, Mount Pleasant, Alperton, Wembley, Middx.
Rudkin & Riley Limited, Cyprus Road, Aylestone, Leicester.
Alfred Herbert Ltd., P.O. Box 18, Red Lane Works, Coventry.

Voss LEVELLERS



*

Precision Levelling of Stamped Parts at High Production Speeds . . .

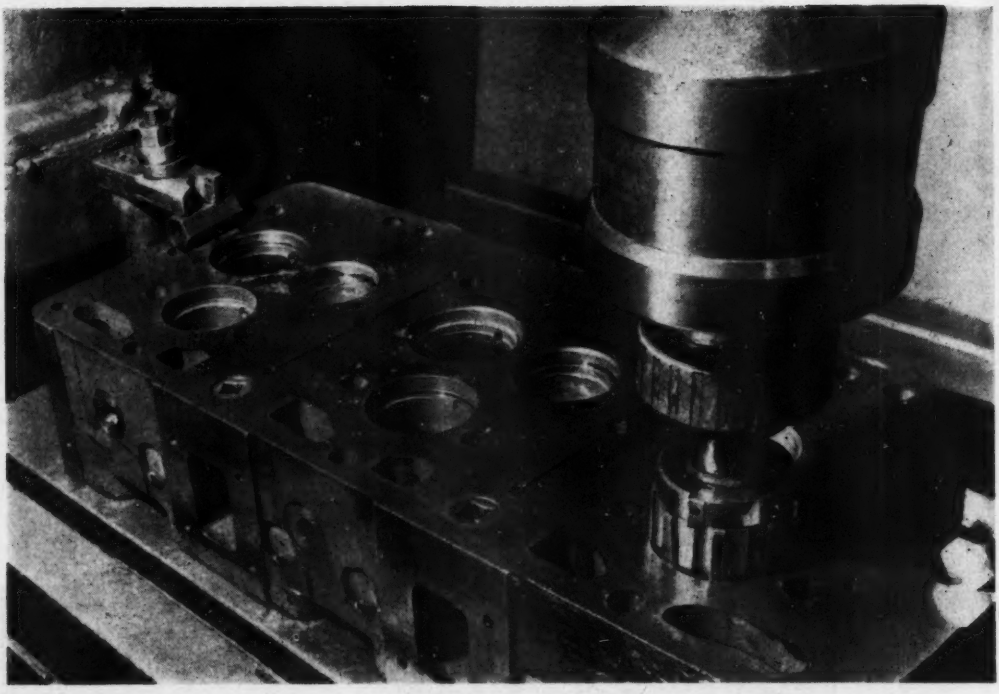
That's what the Voss S.M. Leveller does! As fast as it's fed, it achieves within ·005" of dead flatness — **in one pass.**
It eliminates hand flattening of an enormous variety of stamped parts. It can even be engineered to flatten parts having irregular surfaces.
Voss Levellers will solve almost **any** levelling problem . . . **at high production speeds.**

One major user reports that 2 Voss parts-flatteners and a few operators have replaced 300 workers engaged in hand flattening operations.

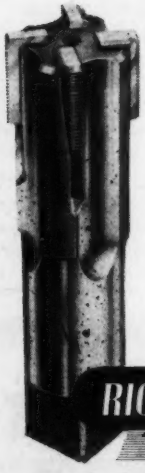
GASTON E. MARBAIX LTD.

DEVONSHIRE HOUSE, VICARAGE CRESCENT, BATTERSEA, LONDON, S.W.11 **Phone: Battersea 8888 (8 lines)**
NRP 3590B

When answering advertisements kindly mention MACHINERY.



tapping at DAVEY-PAXMAN'S with



Galtona

TRADE MARK

Serrated Blade Taps

The illustration above shows the tapping of a Diesel Engine Cylinder Head using a 'Galtona' inserted blade tap of 3¼" diameter, 16 T.P.I.

RICHARD LLOYD LIMITED

GALTON HOUSE, ELMFIELD AVENUE, TYBURN, BIRMINGHAM, 24

Telephone: Ashfield 1801. Telegrams "Cogs, Birmingham"

NORTHERN AREA OFFICE: Britannia House, Wellington St., Leeds, 1. Tel: Leeds 21212

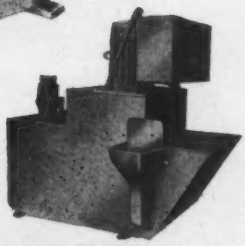
LONDON AREA OFFICE: 240, Romford Rd., Forest Gate, London E.7. Tel: MARyland 7304-5

When answering advertisements kindly, mention MACHINERY.

DE LAVAL TURBO MATIC

FOR THE MOST EFFICIENT CLARIFICATION OF GRINDING AND HONING COOLANTS

DE LAVAL TURBO-MATIC CLARIFIER Type BX 215-34S.



DE LAVAL TURBO-MATIC MINOR CLARIFIER Type WX 209-34

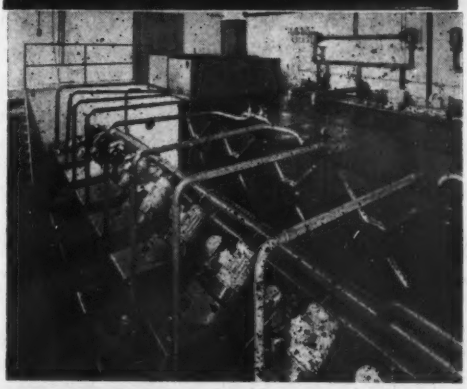
Completely automatic in operation and ensures uninterrupted flow of coolant

By the continuous removal of solids, De Laval Turbo-Matic Clarifiers ensure a coolant clarity unattainable by any other method.

The extracted solids, held in the large capacity bowl, are discharged automatically at pre-determined intervals.

De Laval Turbo-Matic Clarifiers can be used for individual requirements, or coupled up as a centralized installation.

NINE TURBO-MATIC clarifiers, automatically controlled by a timing device, installed by a large British bearing manufacturer for the centralized treatment of mineral oil.



Write now for fully descriptive literature

FACTORY EQUIPMENT DIVISION

ALFA-LAVAL COMPANY LIMITED

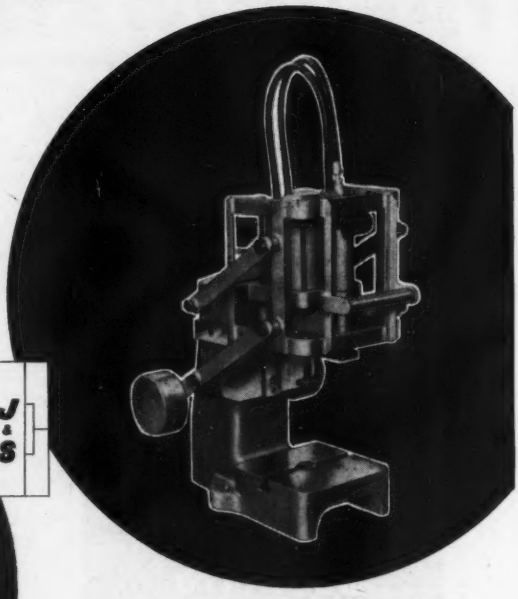
GREAT WEST ROAD · BRENTFORD · MIDDLESEX · TELEPHONE: ISLeworth 1221

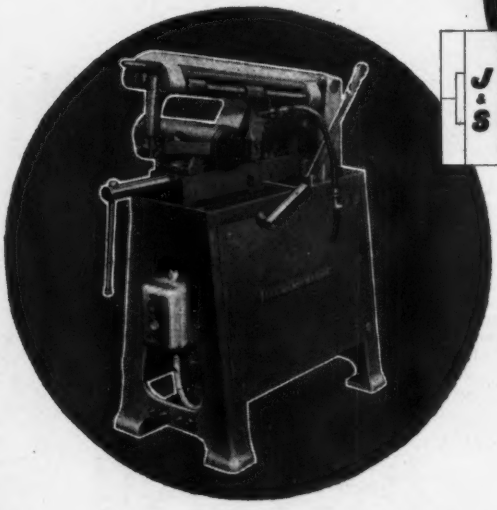
Smee's DL.453

J&S-BRAUNSTONE

AIR OPERATED PRESS

This is a recent introduction to the J & S—Braunstone range of Machine Shop Equipment. It has a 3in. stroke of 100 lb. P.S.I. giving a ram thrust of 1,317 lb. approx. The ram is automatically operated from the guard and cannot descend until the guard completely covers the work table.





J & S

4in. HACKSAW MACHINE

with Hydraulic Relief

Designed for use where its small size and portability are of advantage, i.e., in the many departments of large works where a small machine on the spot saves time, and also for Small Workshops, Stores, Laboratories, Experimental Depts., Schools, etc. The Machine runs at 150 r.p.m. and has a capacity of 4in. at 90°.

R. A. JONES & SHIPMAN LTD · LEICESTER

Telephone 823222. Telegrams 'Chuck' Leicester

Stock Deliveries from our Area Distributors

George Hatch Ltd., London
Henry Osborn Ltd. Newcastle-on-Tyne
Stuart and Houston, Glasgow
Gregory & Sutcliffe Ltd. Huddersfield

Roberts Black & Co, Ltd., Manchester
Needham Engineering Co., Ltd., Sheffield
Pools Tool Co. Ltd., Notts.
Lister Machine Tools (B'ham) Ltd., Smethwick

Listers Tools Ltd., Wolverhampton
James Lister & Sons, West Bromwich
Woodberry Chillcott & Co., Ltd., Bristol
Modern Tool & Equipment Co. Ltd., Belfast

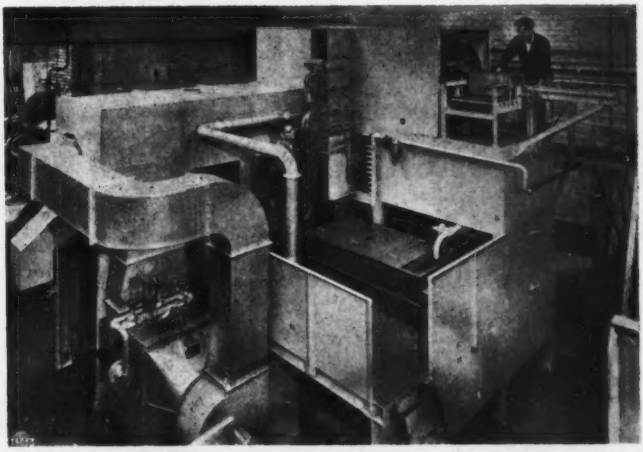
Also available from the Leading Machine Tool Merchants

METAL PARTS *efficiently and rapidly*

Washed Rinsed and Dried by Sturtevant MACHINES

Machines can be supplied to handle several tons per hour

To meet individual requirements, Sturtevant will investigate new production problems and design special machines.



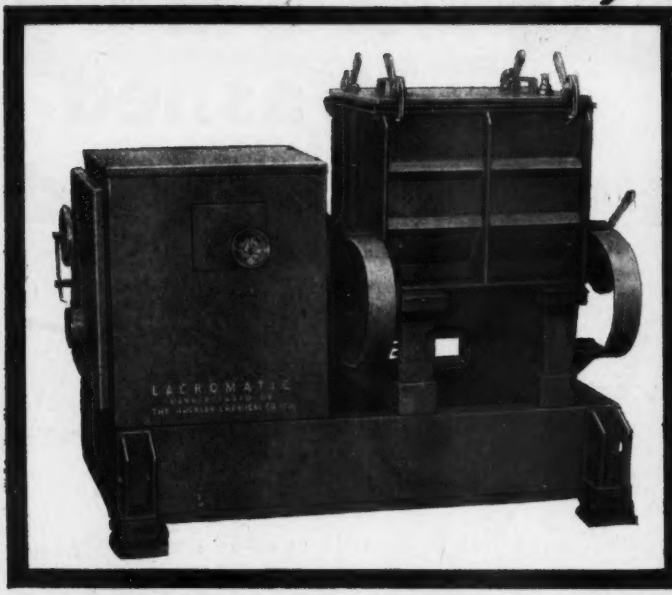
A special rotary transfer washing, rinsing and drying machine for the rapid and continuous treatment of large quantities of screws is shown under construction at our works.

For particulars apply to our reference MY/Z.101

STURTEVANT ENGINEERING CO. LTD., SOUTHERN HOUSE, CANNON STREET, LONDON, E.C.4

AUSTRALIA: STURTEVANT ENGINEERING CO. (AUSTRALASIA) LTD., MILLER ROAD, VILLAWOOD, N.S.W.

Sensational De-Burring Development!



PRECISION FINISHING up to 10 times FASTER

LACROMATIC VIBRATORS

VIBRATION Supersedes ROTARY ACTION

* **Remarkably High Efficiency:** full and even distribution of work load in processing media. Vibrating mechanism produces continuous inter-action and intensive polishing effect **throughout the trough.** Considerable reduction in process times guaranteed. Substantial saving in number of machines and floor area needed.
* **Wider Variety of Applications:** as trough does not rotate, large, unwieldy, and heavy parts are no problem, and it is now possible to polish successfully holes and other shielded areas.

  Less Likelihood of Damage to delicate surfaces and edges. No interlocking or bending of "awkward" shapes and lengths. Much easier loading and unloading even on models without ancillary equipment.
* **Overall Saving of Polishing Media and Compounds** despite greater polishing effect and increased efficiency—chips cannot fall and split.
* **No Danger** from development of excessive pressure when lids are closed for silencing: shorter process times, continuous release through rinsing device. No leakage.
* **Continuous Observation** at all stages of operation, and sampling without stopping vibration process.
* **Tested Construction** of specially welded steel and trough lined with rubber. All models have Precision Hose Coupling, tachometer, and necessary switchgear. Sizes for all known applications. No special foundation needed.
* **Individual Mechanisation** of complete working cycle to suit particular conditions. **Fully automatic** models are individually designed to give push button control of entire cycle.
* **Free Customer Services.** Advice from specialised research engineers. Machines available for sample testing. Process engineers will train new machine operators. Regular machine maintenance. Demonstrations arranged with pleasure.
* Capacity of standard Lacromatic Vibrators in cubic feet:
  One Bowl =2·3, 5·3, 12·0, 17·0
  Two Bowl =5·0
  Four Bowl =·28 (490 cu. ins.) 2·5
* All the other advantages of "Lacromatic" VIBRATORS are contained in free descriptive leaflet. Write for your copy NOW.

Manufactured under licence in the United Kingdom by

HOCKLEY CHEMICAL Co. Ltd

DEPT. M HOCKLEY HILL, BIRMINGHAM 18. Tel.: NORthern 6201/6. Grams.: "HOKLYKEM," Birmingham.

JW.Ad 4893

MACHINERY is registered as a newspaper at the General Post Office and is published every Wednesday by The Machinery Publishing Co., Ltd. The name is a registered trade mark.
All rights of reproduction and translation are reserved by the publishers by virtue of the Universal Copyright and International Copyright (Brussels and Berne) Conventions and throughout the World.

© The Machinery Publishing Company Limited, 1961.

LONDON OFFICE

REGISTERED OFFICE, EDITORIAL, SMALL AND CLASSIFIED ADVERTISEMENTS DEPARTMENTS AND ENQUIRY BUREAU

CLIFTON HOUSE
83-117 EUSTON ROAD
LONDON, N.W.1
Telephone: Euston 8441/2
Telegrams: Machtool, Norwest, London

HEAD OFFICE

SUBSCRIPTION, ADVERTISEMENT, SERVICE, PHOTOGRAPHIC, ACCOUNTS AND BOOK DEPARTMENTS

NATIONAL HOUSE
21 WEST STREET,
BRIGHTON, 1

Telephone: Brighton 27356 (4 lines)

Telegrams: Machtool, Brighton

NEW YORK: 93, Worth Street

PARIS: 15, Rue Bleue

Managing Director: LESLIE R. MASON
Editor: CHARLES H. BURDER
Chief Associate Editor: P. A. SIDDERS
Associate Editors: A. P. LIPSCOMBE, L. WILSON, G. W. MASON, S. C. POULSEN, R. E. GREEN, A. W. ASTROP, A. J. BARKER
Editorial Representatives: F. W. HERRIDGE, R. SUTCLIFFE

PRICE PER COPY:—One shilling and threepence.

SUBSCRIPTIONS:—Inland and overseas, 52 shillings per annum (and pro rata), post free. Cheques and Money Orders should be made payable to the Machinery Publishing Co., Ltd.

ADVERTISEMENTS:—Copy for displayed advertisements, if proofs are required, should reach the Brighton office 21 days in advance of publication. Rates on request.
Small (classified) advertisements can be accepted, space permitting, at the London office up to Wednesday, for publication on the following Wednesday. For rates, see p. 185.

Blocks are held at advertisers' own risk; no responsibility for loss is accepted by the publishers.

MACHINERY

A JOURNAL OF METAL-WORKING PRACTICE & MACHINE TOOLS

Vol. 99, No. 2547 September 6, 1961

MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

COPIES PRINTED ..... 11,500 per week
CERTIFIED DISTRIBUTION ..... 11,293 per week
CERTIFIED PAID DISTRIBUTION ..... 9,827 per week
Copies sold at full price ..... 9,594 per week
Copies sold at reduced prices ..... 233 per week

CONTENTS

Editorial PAGE

Automatic Transmissions for Cars 527

Principal Articles (*For abstracts see next page*)

Making Accessories for Data Processing Machines 528
Specialmatic Machine Tool Control System 537
7th European Machine Tool Exhibition, Brussels 540
(*For detailed list of exhibits see page* 526)
The New Standard-Triumph Vehicle Assembly Hall 558
Some Unusual Operations on Parts for Nuclear-powered Submarines 567
Oberg H. F. Electric Spindles 572
Production of Newbould Segmental Saws 575

Short Articles

New Marking-out and Drilling Machine 536
Milling Machine Set-up for Marking Dials 557
Acru Hand Spring Winding Tool 571
Metalectric Unicarb Installation 574
I.V.A. Illuminated Magnifier 574
Lewis No. 21-FHA Travel-Cut Shape Straightening and Cutting-off Machine 577
New Factory Premises of The Spooner Dryer & Engineering Co., Ltd... 578
Crypto D Totally-enclosed Fan-cooled Motors 579

News of the Industry

Wakefield and District 581
Industrial Notes 584
Scrap Metals Report 586
Machine Tool Share Market 587
Prices of Materials 588

Classified Advertisements 185
Index to Advertisers 219

Abstracts of Principal Articles

Making Accessories for Data Processing Machines .. .. P. 528

Identification tabs are used with the printing plates employed on the data processing machines built by Adrema, Ltd., Telford Way, Acton, London, W.3. Spring-lip tabs are produced on an Edwards 10-ton press equipped with a Clark hitch feed unit and a multi-stage tool, which incorporates air-blast ejection arrangements for the waste and the components. For the production of single type-R tabs, brass strip is first notched and pierced in a mutli-stage press tool, which was made by the company and incorporates an automatic feed mechanism. The strip is recoiled and fed into a multi-slide machine built by Adrema, Ltd., which is cam operated. A length of strip is cut-off and formed to a U-shape. Ears are then bent over at one side, the sides are bent one over the other, and the ears are finally clinched under the pressing. Tabs of this type are produced at a rate of 60 per min. (MACHINERY, 99—6/9/61.)

Specialmatic Machine Tool Control System P. 537

The machine tool control system developed by Specialties Inc., Long Island, N.Y., U.S.A., is particularly intended for use in connection with small and medium-size production work, and an important feature is the claim that it can be operated entirely by shop personnel, no office staff such as planners and programmers being required. For the first workpiece, the machine is set up and operated manually, as in the conventional manner, but the settings are automatically recorded and stored by the system in relation to special coded steel keys which are inserted in an indexing drum at the start of each stage of the machining cycle. Special linear positioning equipment is incorporated which serves to monitor continuously the movements of machine slides and to compare their actual positions with the positions demanded by the control system. In this article, the equipment is described as applied to a Jones & Lamson hydraulically-operated turret lathe. (MACHINERY, 99—6/9/61.)

The New Standard-Triumph Vehicle Assembly Hall .. .. .. P. 558

The new Standard-Triumph vehicle assembly hall at Canley, Coventry, is designed to provide an output of 5,000 vehicles per week, and was completed recently at a cost of £2,500,000. It has three levels, and the top floor, which has an area of 115,200 sq. ft., serves for marshalling. Here, fully-painted and trimmed body shells are grouped in preparation for lowering to the main assembly lines on the centre floor. The movement of body shells in the marshalling area is automatic, and is controlled remotely from a special room in the basement. Closed-circuit television is installed to enable the control room staff to monitor various areas of the top floor. There are three assembly lines on the centre floor, arranged for Herald, Vanguard and TR type cars, and component parts are fed to the lines by way of lifts from the basement storage area. Details are given of the marshalling arrangements, also the main control room, and some interesting aspects of the assembly lines are discussed. (MACHINERY, 99—6/9/61.)

Some Unusual Operations on Parts for Nuclear-powered Submarines .. P. 567

In this article are included some examples of practice at the works of the Electric Boat Division of General Dynamics Corporation, Conn., U.S.A. A Rockford hydraulic shaper/planer is employed for contour-planing fairings for submarine antennae. Many operations on a variety of workpieces are carried out on a Hillyer tape-controlled drilling machine, and other procedures described include cutting a 5-start, 1-in. pitch thread on a Polaris missile tube; honing the bore of a 23-in. diameter nickel-copper alloy cylinder; drilling bolt holes in valve bodies with the aid of a Lapointe Rotomatic table; and plano-milling 35-ft. long plates of pure nickel on an Ingersoll machine. (MACHINERY, 99—6/9/61.)

Production of Newbould Segmental Saws P. 575

Sanderson Brothers & Newbould, Ltd., Sheffield, have made saws for cold cutting steel for many years, and this article describes interesting aspects from the production sequences. Radii and slots are cut in four workpieces at a time on a Wyssbrod hydraulically-operated profile milling machine, and a Snow duplex machine is subsequently used for grinding the sides of the segments. Fixing holes are drilled on multi-spindle Boley machines, also single spindle drills, and the teeth on the segments are form ground on a battery of Heller machines. (MACHINERY, 99—6/9/61.)

Index to Exhibits at the 7th European Machine Tool Exhibition Described on pages 540—557 of this Issue

	PAGE
Brooke rotary transfer machines	553
Caser radial drilling machines	541
Dormer profile tool and cutter grinder	551
Dorries vertical turning and boring mills	540
Eclipse permanent magnet chucks	556
Froriep type 6 KZ 200 vertical turning and boring mill	543
Gambin type Iv milling machine	542
Graffenstaden type FH142 heavy-duty horizontal milling machine	549
Herckelbout spring coiling, grinding and testing machines	545
Kieserling & Albrecht bar turning and tube straightening machines	552
Loewe type DLZ 400 precision centre lathe	548
Marposs electronic gauging equipment	551
Muller type SR 30 radial-arm drilling machine	550
Nutap nut forming and tapping machines	547
Ravensburg type SL500 slotting machine	557
Sicmat type SSU 310 universal gear shaving machine	548
SIG deep hole drilling and cam milling machines	544
S.M.G. hydraulic presses and trimming machines	554
V.D.F. lathe developments	555
Waldrich-Siegen WWDK 90 1 roll-roughing lathe	545
Zeuna-Stärker type F + G nibbling machine	542

EDITORIAL

Automatic Transmissions for Cars

So prominent is the part now played by the motor car in the daily lives of people forming a large proportion of the population, and in the export trade of the country, that any really significant advance as regards either methods of production or performance must be considered a matter of great importance. There has, of course, been steady development both in design and manufacturing techniques during the post-war years and generally high standards have been achieved in both respects. At the same time, it is evident that finality has not been approached in either field, and some more radical changes may be expected in the fairly near future. For example, the merits of the pressure die cast aluminium alloy cylinder block, principally as a means of saving weight and machining costs, appear to have been sufficiently well established to ensure its widespread adoption within a comparatively short period. There is good reason to suppose, moreover, that the extensive application of cold forging to the production of an increasing variety of components, will enable the motor car companies to offer still better value for money.

Unfortunately, in this country particularly, as is only too well known, the programme of road improvement and construction has failed to provide for the great increase in the volume of traffic, or to enable reasonable advantage of the speeds available to be taken safely. In the resulting conditions, effective braking, good steering, general stability, and simplicity of control to ensure the minimum of diversion are necessarily assuming growing significance. The task of driving a modern car can hardly be regarded as difficult, but in the light of the traffic conditions now prevailing there is certainly room for general improvement, mainly in connection with transmission systems. Apart from the introduction of synchromesh, which robbed the action of gear changing of its terrors for the unadroit, and the steering column gear lever, there have been no important improvements from the driver's point of view since the early days of motoring. Speed changing is not in itself a complicated operation, but the constant use of clutch pedal and gear lever which is now so often demanded tends to distract and tire the driver and to cause undue wear and tear of the car.

It appears, therefore, that the time has come for the wider adoption of more refined methods of relating road and engine speeds under the constantly varying conditions which road travel involves. In the past, numerous attempts have been made to improve upon the orthodox 3- or 4-speed gearbox, for example, by the introduction of a very successful self-changing box with preselection, and by the development of steplessly variable transmission systems. More recently, too, there has been evidence of a growing appreciation of the merits of overdrive arrangements. It is only lately, however, that any serious attention seems to have been directed here, either by car manufacturers or users, to the advantages offered by transmissions which function entirely automatically under normal running conditions.

This situation is not perhaps surprising when the difficulties associated with the design and production of a transmission of this type are considered. In view of the requirements to be met, it seems inevitable that any purely mechanical, hydro-mechanical, or electro-mechanical unit must be of considerable complexity. At the same time, it must be compact and not unduly heavy, and must function with a high degree of reliability. To this end, the numerous components must be made from materials of high quality and must be machined and heat-treated to exacting standards. Finally, the complete transmission must be made available at a price which will not add sufficiently to the cost of the car to deter the average purchaser, who, too often, attaches undue importance to initial outlay, and gives insufficient consideration to possible maintenance expenditure. Obviously, these conflicting needs can only be satisfied under conditions of large scale production with modern plant of high efficiency.

Fortunately, owing to the enterprise of certain companies, which have spent large sums in providing the necessary facilities, automatic transmissions which are well suited for incorporation in British cars are now being—or will shortly be—produced in large numbers. It is to be hoped, therefore, that the car manufacturers will take full advantage of this situation firstly to strengthen their competitive position in the export markets where such refinements are already well appreciated. If, as seems probable, home demand also increases rapidly, the necessary expansion in the scale of manufacture will enable still more economical methods to be employed. Obviously, automatic transmissions can be of particular assistance to the less experienced drivers and if they come into widespread use, the amenities of motoring will be considerably enhanced.

Making Accessories for Data Processing Machines

Methods and Equipment Employed by Adrema, Ltd., Acton, London, for the Production of the Bradma Range of Equipment

By P. A. SIDDERS, Chief Associate Editor

EARLIER ARTICLES* devoted to the practice of Adrema, Ltd., Telford Way, Acton, London, W.3, were concerned with tooling and procedures employed for the production of printing plates for use on their Bradma data processing machines. In the first article, it may be recalled, the various types of printing plates were discussed in some detail, and mention was made of indexing and identification tabs, of different sizes and shapes, which can be inserted in slots pierced along one long edge of each plate. Particular reference was made to spring-lip tabs, and single and double type-R tabs, both of which are produced by cutting and forming thin brass strip, and the operations and tools for making these tabs are here considered.

Fig. 1 shows two spring-lip tabs—one inverted—also the strip from which these components are produced, and the sequence of operations may be observed. The lip, from which the tab takes its name, is indicated at A on one tab, and the height that this lip projects from the side-member of the V-shape must be not more than 0·013 in., it being stipulated that the lip must not protrude beyond the plate to which it is assembled. The brass strip from which spring-lip tabs are made is 0·008 in. thick by ¼ in. wide, and is supplied in coils.

Spring-lip tabs are produced at a rate of 120 per min., on an Edwards 10-ton power press, which is fitted with a Clark automatic hitch-feed unit. Referring to the close-up view of the press in Fig. 2, the strip *B* is drawn from a coil on a floor-mounted support, through a Clark straightening and lubricating attachment *C*. The hitch-feed unit, indicated at *D*, is actuated by a wedge-shaped cam block *E*, secured to the top tool assembly. As the press ram descends, the cam block bears against a roller *F*, incorporated in the pantograph linkage of the feed unit, and moves the linkage away from the machine, against the force applied by tension springs at each side. During this movement, gripper units attached to the linkage slide over the strip. When the ram rises, the linkage is returned to its original position by the springs, and the gripper units engage the strip and advance it for a pre-set distance.

* MACHINERY, 99/120—10/7/61 and 99/236—2/8/61.

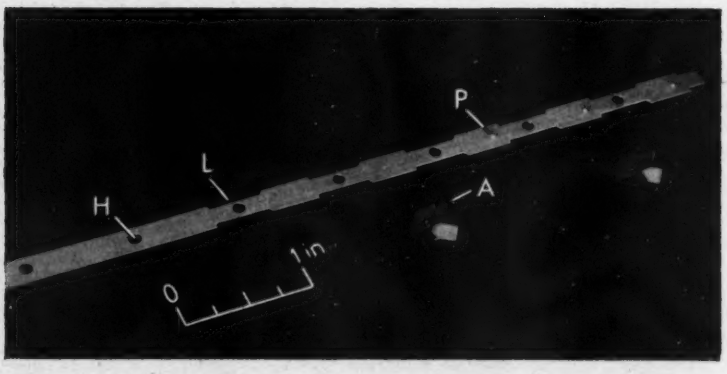


Fig. 1. Two spring-lip tabs for use with Bradma printing plates, and a length of ¼-in. wide by 0·008-in. thick brass strip, showing the various operation stages

MULTI-STAGE TOOL DESIGN

As seen in the close-up view in Fig. 3, a multi-stage tool is fitted to the Edwards press. This tool is built into a Desoutter die set, with a light top and base, and incorporates a fixed stripper plate *G*. At the first stage, a pilot hole (as at *H* in Fig. 1) is pierced in the strip by the punch *J*, which slides in a hardened guide bush in the stripper plate. This hole is engaged by the acorn-

Fig. 2. View of the tooling on an Edwards 10-ton press for the production of spring-lip tabs. The press is equipped with a Clark automatic hitch-feed unit, seen at the left

end pilot pin *K*, also guided by a hardened bush in the stripper plate. Notches (as at *L* in Fig. 1) are cropped in either side of the strip, at the next stage, by the bifurcated punch *M*. It may be observed that there is a narrow groove machined in the front face of this punch member, and a corresponding groove is machined at the rear. Each groove extends for approximately half the length of the projecting portion of the punch and does not break into the central slot of the bifurcated lower end. The purpose of these grooves will be explained later.

A second pilot pin *N* is provided at the next stage, so that the strip is positively located on either side of the cropping punch *M*. An idle stage follows, and a dimple (as at *P* in Fig. 1) is formed in the strip at the next stage (No. 6). The dimple is produced by means of a fixed inverted punch member in the lower tool assembly, in conjunction with a die cavity in the lower end of the member *R* in the top tool. This member is free to slide in a bush in the punch backing plate, and is guided by a bush in the stripper plate. Threaded for part of its length, it is thrust downwards by a strong compression spring that bears against a washer and nut on the threaded portion, and the pressure applied by the spring can be varied by adjusting the nut. The upper end of the member *R* has a cheese head, and the shank of the upper member of the die set top is bored to provide for downward travel past the member *R*.

As a result of the dimpling operation, the strip is deformed slightly, the material adjacent to the square shoulders of the notches at each side being bent

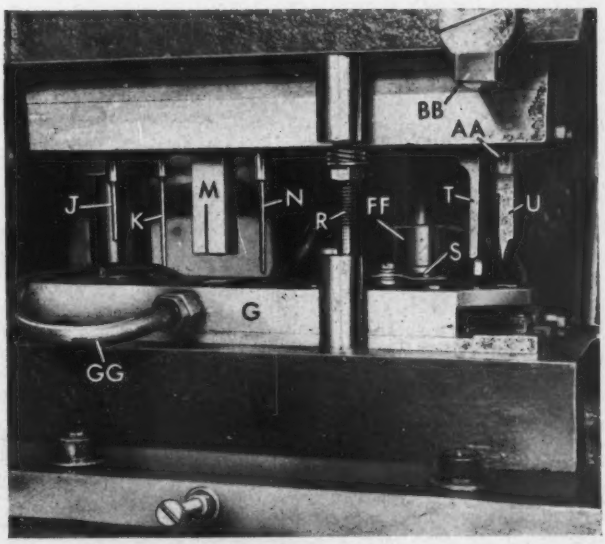


Fig. 3. Close-up view of the press tool for the production of spring-lip tabs. Compressed air is delivered, by way of a valve at the rear, to eject waste material from the notching stage, and the finished tab from the right-hand end of the tool

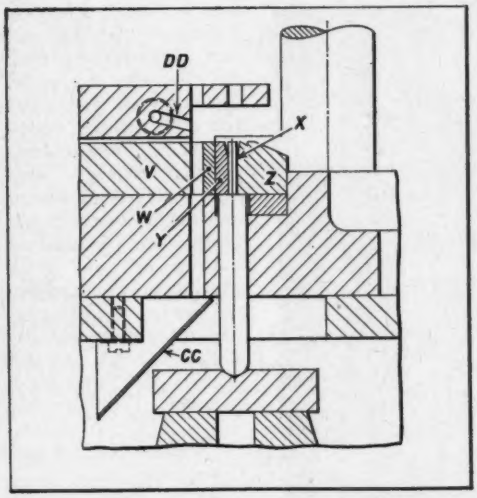


Fig. 4. Scrap view of the final stages of the press tool for the production of spring-lip tabs, showing the support plunger for the final forming stage and the air jet for ejection of the completed component

downwards through a small angle. An idle stage follows the dimpling position, and provision is made for deflecting the strip upwards, to ensure that the work material adjacent to the square shoulders does not catch on the right-hand side face of the cropping die aperture at the final stage. A shallow, arcuate groove is machined in the die-block of the bottom tool, and above the mid-point along the length of the groove, a plunger is provided in the stripper plate. The upper end of this plunger is indicated at S, and it has a slot at one side that is engaged by a cranked leaf spring secured to the top of the stripper plate. At its lower end, the plunger is domed and polished, and it is thrust downwards into the groove in the die block by the action of the leaf spring. The arrangement is such that as the strip of work-material is advanced, it is thrust under the plunger and into the groove, and on leaving the groove it curves upwards, clear of the cropping aperture.

The final stage of the tool provides for cropping and forming, and the punches employed are indicated at *T* and *U*, respectively. Fig. 4 is a scrap sectional view through the die assembly, and the cropping punch operates in conjunction with die elements *V* and *W* to remove a narrow piece of metal across the width of the strip, the piece removed embracing the pilot hole. During cropping and forming, the strip is supported by a sliding plunger *X*, which is urged upwards by a buffer below. As each workpiece is cropped from the strip, it is held between the forming punch and the plunger *X*, and is carried downwards, against the buffer pressure, as the punch continues to descend. The workpiece is bent into a V-shape between the die inserts *Y* and *Z*, and the lip is formed between the inclined step on the insert Z, and the corresponding shoulder on the punch. To provide for grinding the cropping punch *T*, the forming punch *U*, is arranged to slide in a split bush *AA*, Fig. 3, fitted in the punch holder of the upper tool. The forming punch is urged downwards by a spring, and its final position is controlled by a stop, which is set by means of the screw-adjusted wedge *BB*.

Waste material from the cropping operation passes through the die aperture, and thence through a slot in the die-set base, on to a sheet-steel chute *CC*, Fig. 4, whereby it is directed into a container

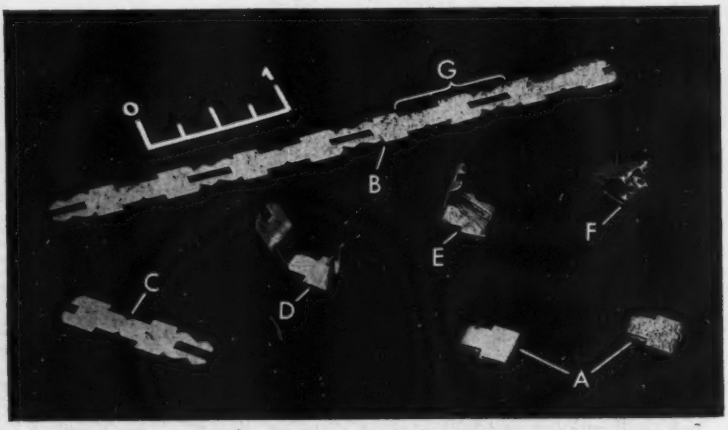


Fig. 5. Single type-R tabs for use with Bradma printing plates are here seen (lower right) with partly completed workpieces and a length of pre-notched and pre-pierced strip from which they are made

below the press bed. As the ram of the press rises, the formed component is stripped from the forming punch, and it is then blown out of the tool by a blast of compressed air from the hole *DD* in the stripper plate, into the guide chute *EE*, Fig. 2.

AIR EJECTION

Flow of air is controlled by a simple valve made by Adrema, Ltd., and indicated at *FF* in Fig. 3. The valve comprises a cylinder fitted to the lower tool assembly, and a rod-type piston secured to the upper tool. There are two ports in the cylinder, also a connection to the shop air supply. Flow of air from the connection to the ports is regulated by the piston, and as the press ram nears the top dead centre position, air is allowed to flow through one of the ports, and thence, by way of a copper tube, to the hole *DD*, Fig. 4, to blow the completed component out of the tool.

From the other port, air is directed along copper tubes, as at *GG* in Fig. 3, to transverse holes in the stripper plate. These holes are in line with the grooves in the bifurcated notching punch *M*, to which reference has already been made. Air passes down these grooves, at the end of each cutting stroke of the tool, to blow the waste material from the cropping operation clear of the die.

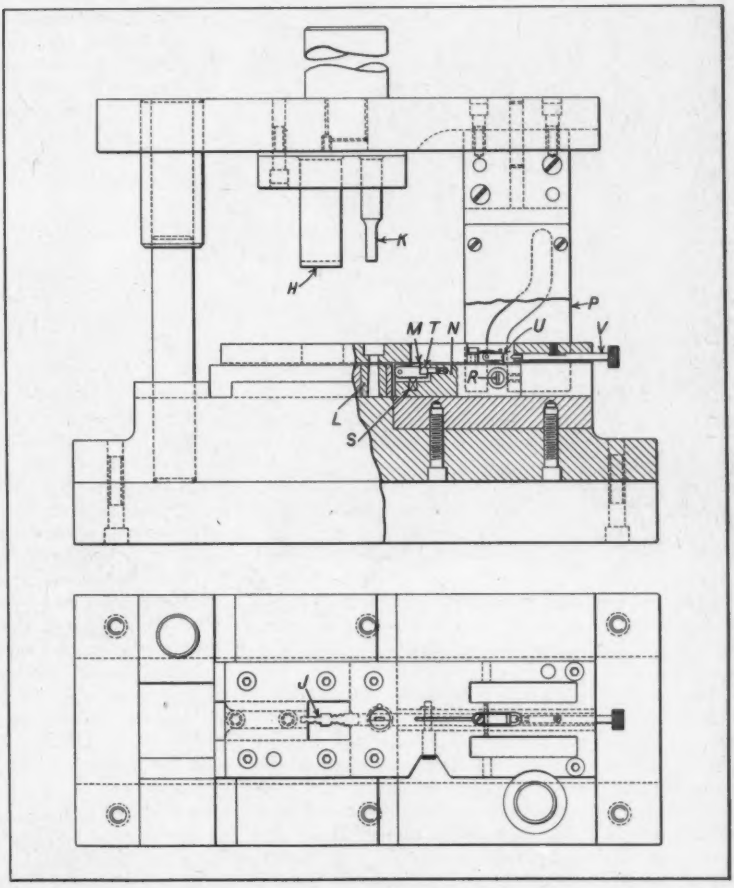


Fig. 6. Sectional and plan views of the multi-stage tool for notching and piercing brass strip, prior to forming in a special Adrema multi-slide machine

PRODUCING SINGLE TYPE-R TABS

Single type-R tabs, as seen at *A* in Fig. 5, are made from half-hard brass strip, 0·4 in. wide by 0·008 in. thick, which is supplied in coils. The strip is first passed through a muli-stage tool, whereby it is pierced and profiled, as seen at *B*, and is re-coiled on leaving the tool. The profiled and pierced strip is then fed into a special multi-slide machine, designed and built by Adrema, Ltd., which serves to produce a tab in a number of stages.

Workpieces after some of these stages are seen in the illustration, and a blank cut from the strip is indicated at *C*. The workpiece at *D* has been formed to a U-shape, and a piece is seen at *E* after the two ears at the end of the long portion have been bent inwards, and the short portion has been bent to an angle of approximately 30 deg. A workpiece is seen at *F* after the long side has been closed over the short side, and the tab is finished by completing the closure and bending

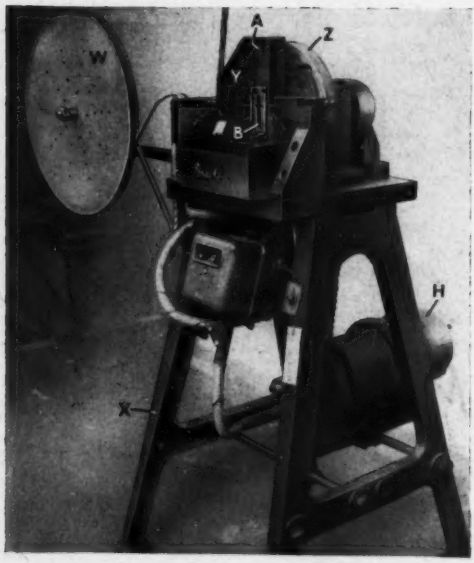


Fig. 7. This multi-slide machine has been built by Adrema, Ltd., for forming single type-R tabs from pre-notched and pre-pierced brass strip. The strip is re-coiled and delivered to the machine on a spool as at the left

the ears on the long side over the folded-up body.

PRESS TOOL WITH BUILT-IN FEED MECHANISM

The multi-stage tool for notching and piercing the strip is seen in Fig. 6, and it incorporates a cam-operated feed mechanism. Built into a pillar die set, the tool has a fixed stripper plate and die inserts for each cutting stage. At the first stage, a profiled notch, as indicated at *G* in Fig. 5, is cut in each side of the strip by punches, as at *H* in Fig. 6, which operate in conjunction with a die insert *J*. A slot is pierced in the strip at the second stage, by the action of a punch *K*, and a die insert *L*. This slot is used for feeding the strip through the tool, and is engaged by a pawl *M*, pivoted in a block *N* that is free to slide in the lower tool assembly.

Motion is imparted to the block *N* by dog-leg tracks in cam plates, as at *P*, which are secured to the top bolster of the tool. The tracks are engaged by rollers at either side of the block, and each roller is mounted on an eccentric pin, as at *R*, which provides for taking up wear of the roller and cam track. A spring *S*, in a pocket in the sliding block, urges the pawl in an anti-clockwise direction (as viewed in Fig. 6), and rotation of the pawl is limited by a flat on a transverse pin *T*.

A second pawl *U* is pivoted in a slot in the stripper plate, and is urged in a clockwise direction by a leaf spring. At the end of each feed motion, the pawl *U* enters a slot in the strip of work-material, and retains it in position when the block *N* and the feed pawl *M* are returned, during the upward motion of the press ram.

Provisions are made for holding the pawls clear of the work-material to facilitate removal of the strip from the tool, in the event of a fault. The transverse pin *T* has a slot at one end so that it can be turned with the aid of a screwdriver.

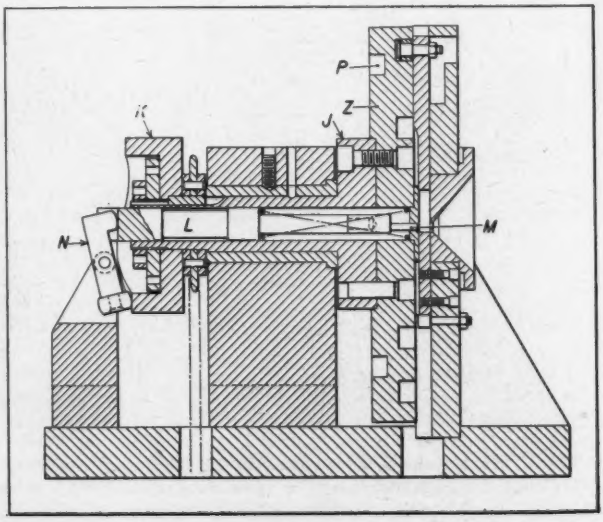


Fig. 8. Sectional view of the Adrema multi-slide machine showing the camshaft, with the main disc cam at the right and the auxiliary bell cam at the left. Three tracks in the front of the main disc serve for operation of the punch slides, and there is a single track at the rear, for the feed slide

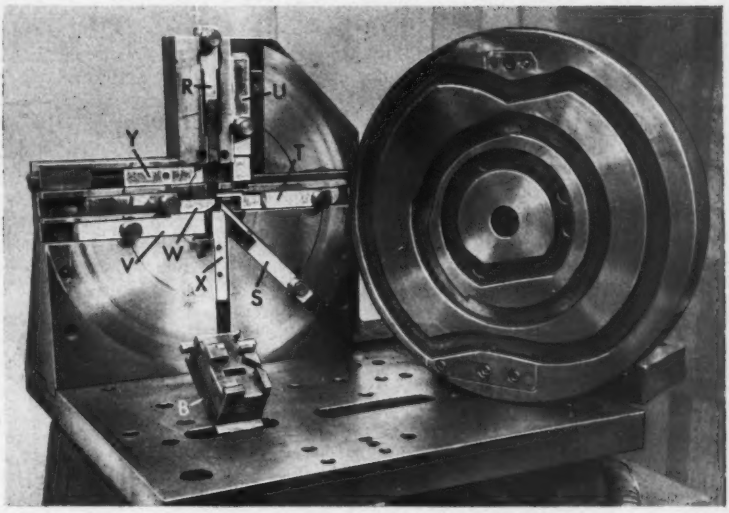


Fig. 9. In this view of the multi-slide machine, partly dismantled, the punch slides can be clearly seen. The camshaft support block has been swung away from its normal position to show the tracks in the front of the main cam disc

When it is turned in an anti-clockwise direction, from the position shown, the flat on the pin moves clear of the pawl *M*, and the latter is depressed, below the strip. The pawl *U* is raised by the conical end of a sliding plunger *V*, which engages a dimple in the end face.

SPECIAL MULTI-SLIDE MACHINE

Fig. 7 is a general view of the special Adrema multi-slide machine, to which the pierced and notched strip is passed after it has been recoiled on a large-diameter spool, as seen at *W*. The main structure of the machine incorporates legs, as at *X*, from an early design of Bradma printing machine. On these legs is mounted a thick mild steel bedplate, with mild steel buttress blocks that support a main plate *Y* made from tool steel. To the rear of the main plate there are bearing blocks that support a camshaft carrying a main cam disc *Z*, also a bell cam at the end remote from the main plate. Drive is transmitted to the camshaft, which runs at 60 r.p.m., by means of a chain and sprockets, from a ¼-h.p. motor *H*, with integral gearbox.

Details of the camshaft can be seen in Fig. 8, which is a sectional view on the centre-line of the machine, and the main cam disc is again indicated at *Z*. The camshaft *J* runs in a plain bearing, and the bell cam is seen at *K*. This cam serves to actuate a sliding member *L*, spring loaded towards the rear of the machine, and at the front end of this member is mounted a forming mandrel *M*, which also serves for the ejection of the finished component. The member *L* and the mandrel *M* are advanced by the action of a follower lever *N*, pivoted on a bracket at the rear of the machine, and this lever is fitted with a part-spherical roller which bears against the operating face of the bell cam.

There are three tracks on the front face of the main cam disc, and one on the rear face, as seen at *P*. Fig. 9 shows the machine partly dismantled, with the camshaft support block swung to one side so that details of the main cam disc and the forming slides may be observed. The three tracks on the front of the disc may be clearly seen, and attention is drawn to the inserts provided at the areas of greatest pressure on the outer track, namely, those that provide for the first bending stage and final closure of the component. These inserts are made from tool steel, and are hardened, whereas the body of the disc is of unhardened tool steel. The outer track of the cam disc serves to operate the first forming punch *R*, the kinking punch *S*, and the side punch *T*; the middle track, to operate the cropping punch *U* and the clinching punch *V*; and the inner track, the second forming punch *W*. Each punch is fitted with a roller that engages the cam track, and the punch is positively advanced and withdrawn. The roller is mounted on an eccentric pin that provides for adjustment of the final position of the punch. Access to the threaded end of each pin, and the associated locking nut, is gained by way of a hole in the main plate of the machine, as seen at *A* in Fig. 7. Carbide tips are brazed on to the working ends of the first forming, cropping, and clinching punches.

The punches operate in conjunction with a combined "die" and guide block, also an anvil *X*, Fig. 9. This anvil is normally fixed in position, but it can be adjusted for height by means of an eccen-

tric pin, against which the lower end bears. A die and guide block is seen at *B*, resting on the machine bedplate, and a similar block is assembled to the main plate in the illustration, and is also visible at *B* in Fig. 7. As seen in Fig. 9, the inner face of the block is machined away to leave a series of projections that serve for forming the work or guiding punches, and the projections associated with the first forming punch *R* and the cropping punch *U* are provided with Stellite inserts. A rectangular hole is cut in the block to permit ejection of the finished tab.

In addition to the punches and anvil, the main plate carries a stop *Y*, which can be adjusted horizontally by means of a screw. The inner end of this stop is machined to form a thin blade, which enters the slot in the leading end of the strip (at the left in Fig. 5).

Sectional and scrap views of the machine are given in Fig. 10, and the slides have been identified by small letters, to correspond with Fig. 9. The single cam track in the rear face of the disc provides for operation of the feeding slide for the strip material. This slide is indicated at *c*, in the right-hand scrap view, and it is carried in a bracket secured to the bedplate, at the rear of the cam disc. The inner end of the slide carries a roller, on an eccentric pin, and at the outer end there is a block whereon is pivoted a feed-pawl *d*. Of L-shape, this pawl has a tongue which enters the slots pierced in the strip, in a similar manner to the feed pawl of the press tool already described. The pawl is urged upwards by the tension of an ordinary elastic band, which is stretched over horizontal pins that project from the pawl and the block on the feed slide. An elastic band is employed because it has been found that it has a longer life than a tension spring of the required size.

From the coil, strip is passed over a roller on the upper end of a lever that is pivoted on the machine frame, and thence through the housing *e*. The roller and lever assembly is not shown in Fig. 10, but the roller is just visible in Fig. 7. Within the housing *e*, Fig. 10, there is a micro-switch *f*, with a spring-loaded ball actuator. A hole is drilled in the top plate of the housing, immediately above the ball actuator, and the setting of the switch is such that if the ball rises into contact with the metal surrounding the lower end of the hole, the switch contacts are opened. The switch is connected in series with the drive motor of the machine, and the strip of work material passes between the ball and the top plate, thus preventing the ball from rising fully, so that the contacts remain closed. When the end of the strip passes clear of the ball, or if the strip breaks, the ball is allowed to rise, and the machine is stopped. It may be mentioned that the roller, over which the strip passes as it enters the machine, is spring loaded to impart a slight upward curvature to the material. This curvature ensures that the leading edge of the strip does not drop as it is fed forwards and foul the forming members on the die and guide block.

The die and guide block fits in a rectangular aperture in the main plate, and at one side of this

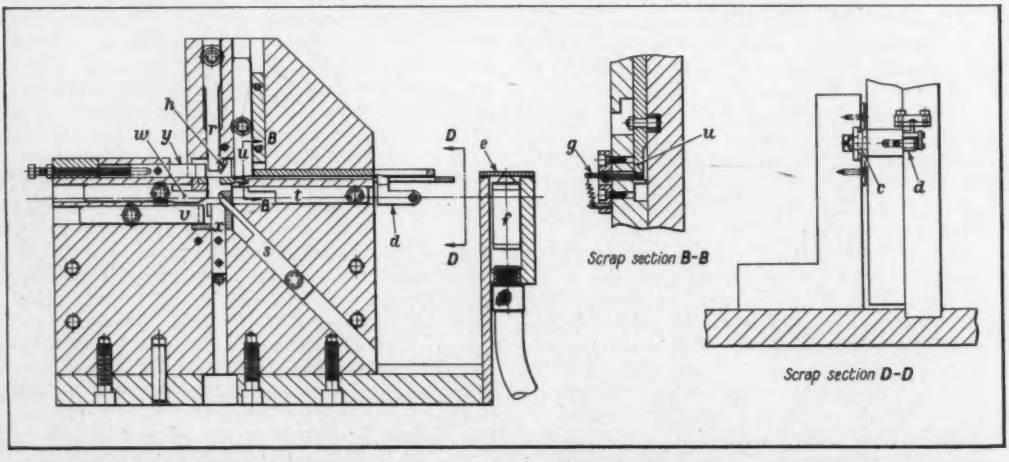


Fig. 10. Sectional and scrap views of the Adrema multi-slide machine for type-R tabs. Each punch is provided with a follower roller mounted on an eccentric pin which provides for adjustment of the final setting. Similar arrangements are made for the feed slide and the forming anvil

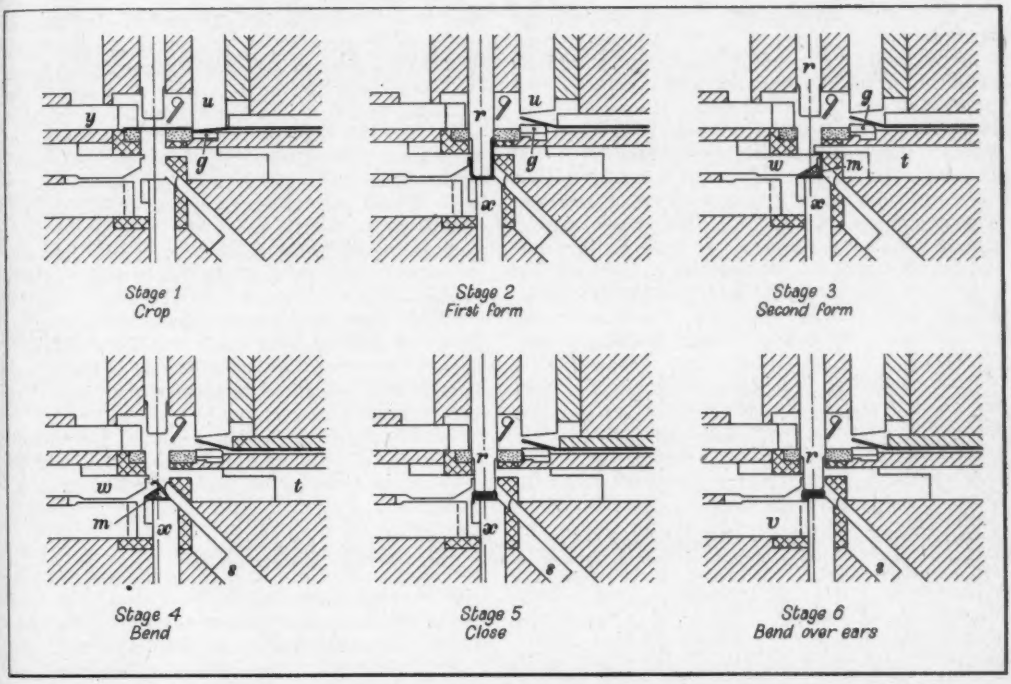


Fig. 11. The various stages in the production of a single type-R tab are here indicated. A length of strip sufficient for one component is cropped from the strip at stage 1. At stage 2, the cut-off material is bent to a U-form, and at stage 3, the shorter side is bent over a mandrel and ears on the longer side are bent inwards. The longer side is pre-bent in readiness for final closure at stage 4, and the component is closed between the vertical punch and the anvil at stage 5. Forming is completed by clinching over the ears at stage 6

aperture, the plate is slotted to permit the passage of a finger member *g*, indicated in the scrap section on the line *BB*. This finger is pivoted on a small support plate which is screwed to the front of the main plate, and the end that projects outwards from the support plate is connected to a tension spring. The inner end of the finger extends below the cropping punch *u*, and it serves to support the strip of work-material. When the cropping punch descends, the finger is moved downwards, against spring tension, and as the punch rises, the finger lifts the new leading end of the strip above the top face of the associated insert on the die and guide block, so that it clears the insert during the next feed cycle. A deflector *h*, Fig. 10, is fitted to the block, to prevent the leading end of the strip from lifting excessively, and ensure that the metal from which a tab is to be formed lies correctly across the two inserts on the block.

SEQUENCE OF FORMING OPERATIONS

Fig. 11 shows the sequence of forming operations required to produce a finished tab, and in the following description references are made in parenthesis to the partly formed workpieces in Fig. 5. As seen at stage 1, the previously notched and pierced strip of work-material is advanced until the closed-end of the pierced slot engages the stop blade *y*. The cropping punch *u* is then moved down, to cut off a length of work-material sufficient to make one tab (*C*, Fig. 5), and depresses the finger *g*, also the leading end of the remainder of the strip. At stage 2, the first forming punch *r* makes its first downward motion and the cropping punch is withdrawn, allowing the finger *g* to rise, and thus lift the leading end of the strip, as indicated. The punch *r* bends the cut-off length of work-material between the projections of the die block so that it assumes a U-shape (*D*, Fig. 5), and

the material is carried down into contact with the anvil *x*.

At stage 3, the forming mandrel *m* (also indicated at *M* in Fig. 8) is advanced and the first forming punch *r* is withdrawn. The second forming punch *w* is then thrust inwards to bend the shorter side of the U-formed blank over the mandrel *m*, and the side punch *t* is next moved in to pre-form the ears over the lip on the second forming punch (*E*, Fig. 5). For stage 4, the mandrel *m* is held in the advanced setting, and the punches *w* and *t* are withdrawn. The kinking punch *s* is then moved inwards and pre-bends the longer side of the U-formed blank over the mandrel, also over the previously bent shorter side (*F*, Fig. 5).

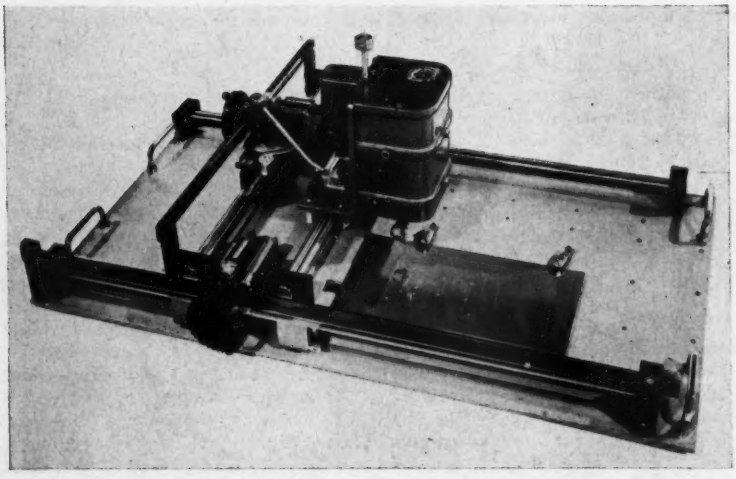
The mandrel *m* is withdrawn for stage 5, and the kinking punch *s* is retracted, before the first forming punch *r* makes its second downward movement. At the end of this movement, the longer side of the U-formed blank is closed over the shorter side, and the partly-formed tab is flattened between the punch *r* and the anvil *x*. The previously-bent ears then project downwards beyond the main body of the tab, and at stage 6 the clinching punch *v* is advanced to bend the ears under the tab body to complete the forming of the component (*A*, Fig. 5). When the punches *r* and *v* have been withdrawn, the mandrel *m* is again moved forwards to thrust the completed tab off the anvil *x* and through the rectangular hole in the die and guide block, and it falls into the container at the front of the main plate of the machine.

Double type-R tabs are produced on an earlier design of Adrema multi-slide machine, which is arranged for hand loading of pre-cut blanks, since these tabs are required in smaller quantities than are the single type.

Other examples of tooling employed for pressed components at the works of Adrema, Ltd., will be described in a further article in MACHINERY.

New Marking-out and Drilling Machine

Developed by OPTO-mechanisms, Inc., Mineola, Long Island, N.Y., U.S.A., the Taskmaster marking-out and drilling machine shown in the accompanying figure is claimed to permit the drilling of holes within limits of ±0·001 in. for position, within an area measuring 36 in. by 36 in. The head is arranged for transverse movement on a carriage that, in turn, can be moved longitudinally, and both units move on cylindrical guides. To achieve the required accuracy, the guides require to be straight to within less than 0·001 in. in 36 in., and to this end special adjusting units are provided for each guide. These units are spaced at 9-in. intervals and provide for "flexing" the cylindrical rods, to eliminate errors in straightness.



New marking-out and drilling machine developed by OPTO-mechanisms Inc., Long Island, U.S.A.

The longitudinal and transverse movements are made by hand, through racks and pinions, and the distance travelled in each direction is recorded by a small digital counter. To compensate for dimensional variations in the machine due to temperature changes, there are special cams which can be set with reference to calibrated scales. These cams serve to reset the index pointers of the counters, and with this arrangement compensation is made for expansion or contraction of the equipment.

Specialmatic Machine Tool Control System

AN UNUSUAL APPROACH to programme control for machine tools has been adopted by Specialities Inc., Skunks Misery Road, Syosset, Long Island, New York, U.S.A. in developing the Specialmatic system, which is intended particularly for use in connection with small and medium-size batch production. An important feature of the system is that it is intended to be operated entirely by shop employees, and it is stated that no office staff, such as planners or programmers, are required. No tapes or punched cards are used, and while part of the system involves the use of a binary code, no knowledge of this mathematical procedure is required by the operator. Groups of holes, in a binary arrangement, are provided in the ends of special stainless steel keys and each key has an integral tag whereon is marked a machine function —for example, tool-post index, feed stock. These keys are inserted in a special indexing drum, in the order in which the various functions are required, and there is a photo-electric reading device which scans the holes and passes appropriate signals to the electronic control equipment.

A typical application of the Specialmatic system, in this instance to a Jones & Lamson turret lathe, with bar feeding equipment, is shown in Fig. 1. The feed motions on this machine are operated hydraulically, and are steplessly-variable, and there are 32 spindle speeds, each of which can be automatically selected and engaged by the Specialmatic equipment. Seen at the left, the hydraulic pressure supply unit is located adjacent to the bar feed, and the Specialmatic control panel is mounted at the centre, in front of the headstock. It may be noted the Specialmatic equipment requires no floor space beyond that normally occupied by the machine. A close-up view of the panel is shown in Fig. 2, and it may be noted that the controls are divided into three sections, headed Turret, Carriage, and Cross-slide.

The various dials are employed for setting the end points of the movements to which they relate, also the required feed rates. In the bottom left-hand corner of the panel there is a small compartment, provided with a hinged door, and this compartment serves to house the indexing drum in which the stainless-steel keys are inserted. A typical selection of keys is shown in Fig. 3, and it will be observed that they are L-shaped. The punched holes, in binary code, are situated towards the free end of the long leg of the key, and the turned-down portion is painted white and bears a short description of the function to be controlled. Close to the bend, and in the longer leg of the *L*, there is a key-hole type slot, whereby the key is secured to the indexing drum. A close-up view of the drum, with a number of keys in position, is given in Fig. 5.

The displacement of each sliding member of the machine is continuously monitored during its movement by means of special units of the type shown in Fig. 4. Known as a sequential linear-position-

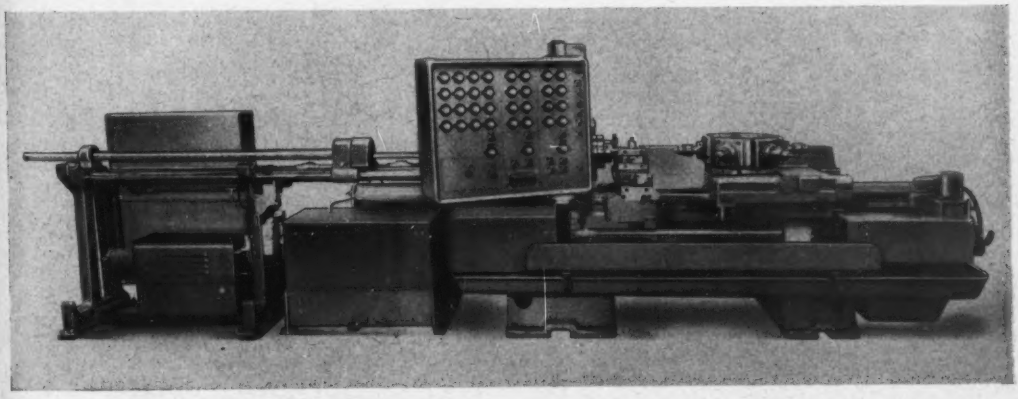


Fig. 1. A Jones & Lamson hydraulically-operated turret lathe equipped with Specialmatic programme control

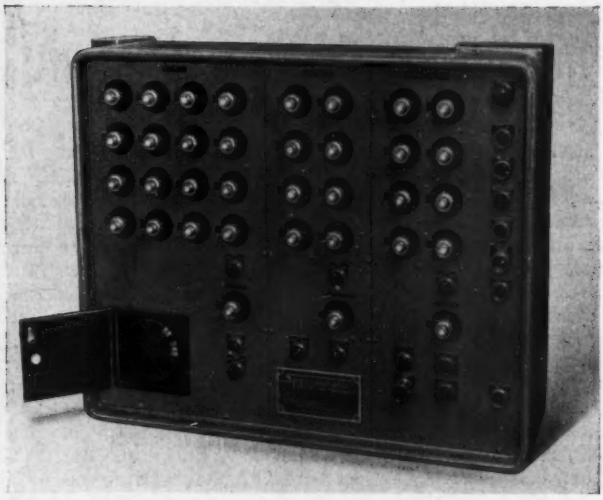


Fig. 2. Close-up view of the main Specialmatic control panel for the turret lathe shown in Fig. 1

ing transducer, the unit comprises a cylindrical bar *A*, which is built up from a number of blocks placed end to end, each block being accurately ground to a specified length, within close limits. Surrounding this bar, and free to pass over it without contact, there is a sleeve portion *B*, incorporating windings to which electrical current is applied. Current is thereby induced in the bar *A*, the value of which varies according to the linear position of the sleeve *B*.

The bar *A* is secured to a sliding member and the sleeve *B* to a fixed member of the machine, and signals from the bar are passed to the electronic control equipment where they are compared with others, which represent the demanded position of the slide as set-up on the dials on the control panel. Movement of the slide continues until the two sets of signals are in agreement, and it is stated that with this equipment the position of a slide can be repeated to an accuracy of ±0·0002 in.

The machine shown in Fig. 1 is set-up as follows. For a given workpiece, the sequence of operations is determined and the tools are selected in the conventional manner for a turret lathe. Next, the setter selects the necessary stainless-steel keys to suit with the sequence of operations, and inserts them in the required order in the indexing drum. He sets a switch on the control panel to "set-up," and selects the spindle speed, feed rate, and length of traverse for the first operation by means of the appropriate dials. Subsequently, he starts the machine cycle manually, and the first operation proceeds.

When this operation has been completed, the machine stops, and the setter acertains that the machining has been performed satisfactorily and that the required dimensions have been maintained, adjustments being made to the dial settings as necessary. When he is satisfied with the first operation machining, the setter presses a button on the panel and the data are automatically recorded in a memory system and related to the key which is in the working position on the drum. Sub-

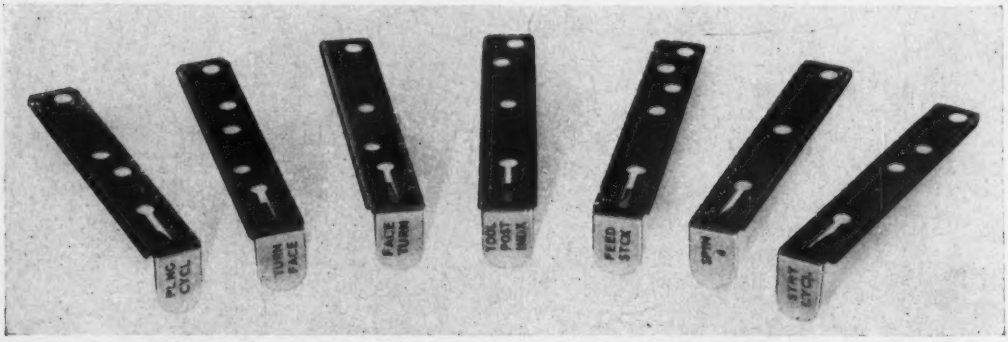


Fig. 3. Examples of the stainless-steel keys which are inserted in an indexing drum and control the sequence of operations. Each key has holes punched in a binary code

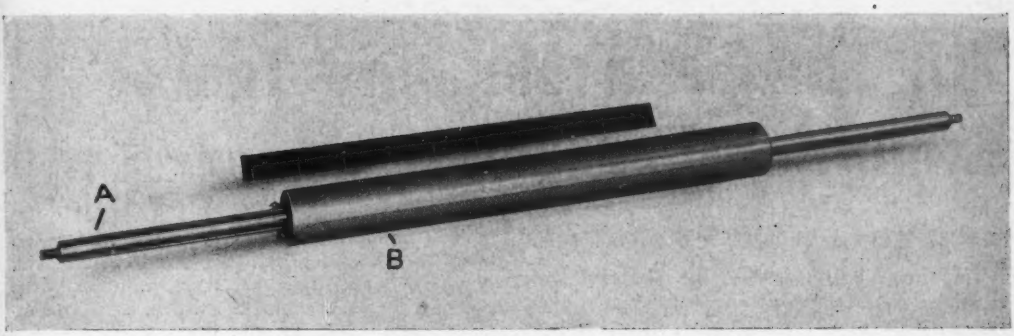


Fig. 4. The linear positioning equipment employed with the Specialmatic system for monitoring the movements of machine slides

sequently, the drum is indexed, to bring the next key into position, and the procedure is repeated for the second operation. In this way, the first workpiece is produced complete, and in separate stages, the procedure being generally similar to conventional turret lathe practice. For subsequent workpieces, however, the machine is set to "automatic" and the memory system takes charge, to produce components successively until the bar stock is exhausted.

A total of 36 stainless-steel keys is provided, and since each key can control a maximum of three functions, provision can be made for a total of 108 operations to be provided for. A manual control enables the tool to be retracted during—or at the end of—a trial cut, so that the setter can measure the portion which is being machined and make any necessary adjustments to the setting dials. There are also facilities for adjusting the feed rate during cuts, as may be required to suit the material or the tool, and it is the final setting which is subsequently recorded by the memory system.

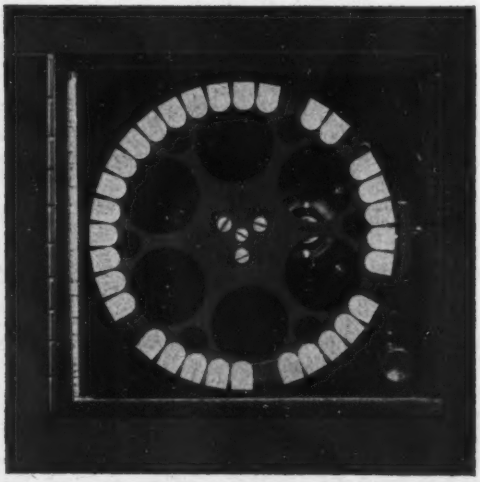


Fig. 5. Close-up view of the indexing drum with a number of keys in position

The company states that a skilled setter can be trained to operate the Specialmatic system in approximately 4 hours, and that for a turret lathe the set-up time is only slightly longer than is required for a conventional machine. Once the equipment has been set, however, the machine requires no supervision, other than inspection of the tools for wear, removal of swarf, and replenishment of the bar stock.

In addition to machines of the type here considered, the Specialmatic system is claimed to be suitable for application to boring, grinding, drilling and milling machines, also to welding equipment, and hydraulic, mechanical, and electrical actuators of a variety of types.

FLEXELLO STILLAGE CASTORS. To facilitate transport of stillages, special castors have been introduced by Flexello Castors & Wheels, Ltd., Slough, Bucks. They comprise heavy gauge steel pressings, with cast iron wheels and nickel chromium steel ball bearing swivels, and may be readily welded or bolted to the under-sides of the stillages, without interfering with normal handling and stacking operations.

When thus equipped, stillages may be readily moved on the factory floor to and from pick-up points, and the need for manœuvring fork-lift trucks among machines may thus be avoided.

7th European Machine Tool Exhibition-Brussels SECOND ARTICLE

DORRIES VERTICAL TURNING AND BORING MILLS

Three machines are on display from the range of single- and double-column vertical turning and boring mills built by Dorries, A.G., Duren, Germany (Elgar Machine Tool Co., Ltd., 172-178 Victoria Road, London, W.3), and it may be noted that, in accordance with the unit construction system employed by the company, several of the principal units incorporated are identical.

On each machine, the work-table is mounted in precision anti-friction bearings, and drive is taken through a gearbox which provides 24 speeds in the ratio of 1:1·19. If required, the speed may be altered while cutting is in progress. The cross-rail normally carries a single saddle, which may be equipped either with a slide with a 5-position indexing turret, or a ram for boring small-diameter holes, the maximum vertical travels of these members being 30 and 40 in., respectively. A total of 16 feeds from 0·002 to 0·315 in. per rev. can be selected while the table is running, and rapid traverse at 80 in. per min. is also obtainable, motion being transmitted to the slides by means of screws and double nuts. The wide range of extra items which is available includes equipment for maintaining constant cutting speed during facing operations, for screw-cutting and taper turning, and for copying under electrical control, also a coolant system.

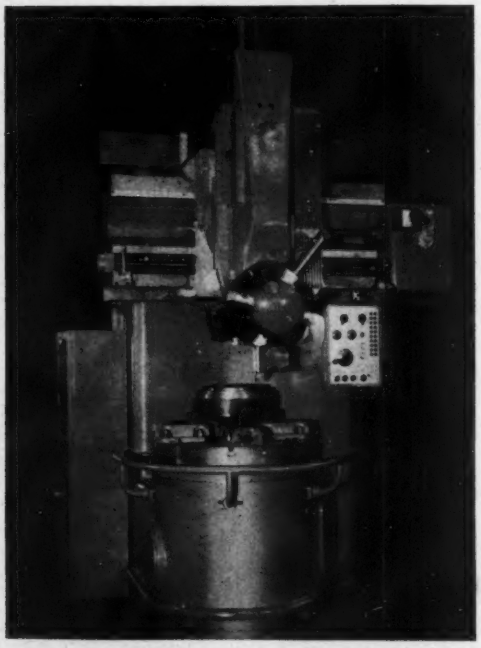


Fig. 1. The Dorries type SD 80 single-column vertical turning and boring mill, here shown, is equipped for programme control of the operating cycle

Designated type SD 80, the machine shown in Fig. 1 has a 32-in. diameter table, and will turn diameters up to 40 in. Workpieces with maximum heights of 28 and 40 in. can be accommodated under the fixed cross-rail and the turret slide, respectively. Equipment is incorporated for programme control of the working cycle, and a selector switch provides for operation of the machine either manually or automatically. With the latter system, a total of 50 switch positions covering all the functions available can be selected, and a single position provides for a slide movement at rapid traverse and feed rate, in succession. Successive positions are determined by means of limit switches, which are operated by accurately-adjustable dogs on carriers associated with the vertical movement of the turret slide, and the horizontal movement of the turret saddle. The changes, also the position that is in use, are indicated by signal lamps. The equipment can be set so that any position is repeated or skipped, as required. Drive for this machine, which weighs approximately 8 tons, is taken from a 32-h.p. motor, and the table speeds available may range from 9·5 to 500, 8 to 420, or 6·7 to 355 r.p.m.

Workpieces with a maximum weight of 8 tons can be supported by the 63-in. diameter table of the type 160/2,000 machine, which will turn up to 79 in. diameter. On the machine exhibited, the right-hand cutting head on the cross-rail is equipped with a quick-change tool-holder. The

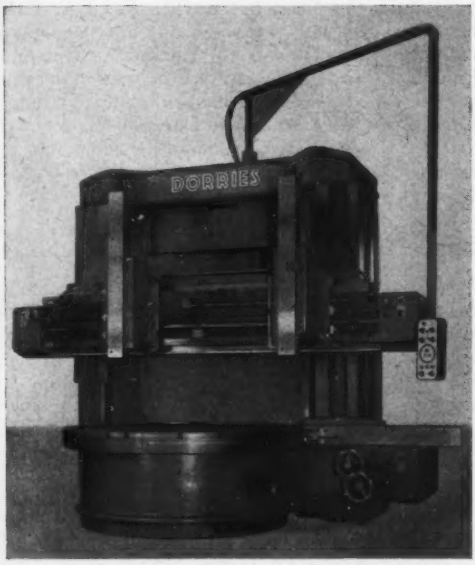


Fig. 2. On this Dorries type SD 250 double-column vertical turning and boring mill, extended travel is provided for the cross-rail, on which is mounted two ram-type boring heads that also have extended movements

other tool-head is provided with a milling attachment, for cutting longitudinal slots, also a standard tool-holder, for drilling and boring. A main drive motor of 32 to 48 h.p. can be provided, and table speeds from 2·85 to 150 r.p.m. are normally obtainable. The cross-rail has a traverse of 32 in. on the column ways, and the maximum distances from the table surface to the under-side of the rail and the turret slide are 44 and 56 in., respectively. A side head is mounted on the right-hand column ways and the ram-type slide, which is equipped with a turret tool-holder, has a horizontal movement of 30 in. A maximum distance of 31 in. is obtainable between the slide and the table surface.

Diameters up to 110 in. can be turned on the type SD 250 machine shown in Fig. 2, and the columns are of greater height than standard, the maximum distance between the surface of the 67-in. diameter table, which will support workpieces weighing up to 12 tons, and the under-side of the cross-rail being 79 in. A boring ram with an extended traverse of 59 in. is provided on each of the two saddles mounted on this rail, and the left-hand unit of the machine that is exhibited is equipped with an attachment for internally grinding conical sleeves. This attachment may be quickly removed by releasing a taper adapter.

The side head on the right-hand column ways can be traversed vertically to obtain a maximum distance of 51 in. between the ram-type turret slide and the work-table. Main drive is taken from a motor which may be of various sizes up to 60 h.p., and the table speeds normally available range from 2·1 to 112 r.p.m. The weight of this machine is approximately 33 tons.

CASER RADIAL DRILLING MACHINES

The radial drilling machines built by Casati Ernesto & F. Caser, S.p.A., Pavia, Italy (Selson Machine Tool Co., Ltd., Sunbeam Road, London, N.W.10) include the type F100 illustrated in Fig. 3. This machine has a drilling capacity of 4 in. diameter in steel, and 5¼ in. diameter in cast iron, and is available with arm lengths of 8 ft., 11 ft. 6 in., and 13 ft. Drive to the spindle is taken from a motor of 20 h.p., and the 32 speeds range from 12 to 1,500 r.p.m. There are 16 feed rates from 0·002 to 0·077 in. per rev., and both the speeds and feeds can be pre-selected and are engaged hydraulically.

Feed rate can be changed while the drill is cutting, and advantage can be taken of this facility to avoid undue loads when the drill is breaking through the work. An electro-hydraulically controlled multiple-disc clutch is incorporated in the main spindle drive, and the feed motion is engaged

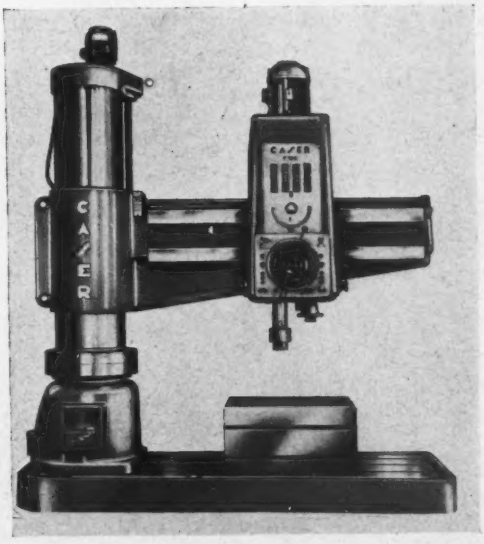


Fig. 3. Caser type F100 radial drilling machine

and disengaged by an electro-magnetic clutch. All the controls are conveniently centralized on the spindle saddle. Other features include an electro-magnetic spindle brake, adjustable electro-hydraulic locking of the spindle saddle to the arm, and of the arm rotary movement, and automatic locking of the arm to the column. A system of automatic continuous lubrication is provided between the arm on the column.

Other machines in the range include the type F50 with a drilling capacity of 2 in. diameter in steel and arm lengths of 4 ft., 5 ft. 3 in., and 6 ft. 6 in., and the type F30, with arm lengths of 2 ft. 6 in., and 3 ft., and a drilling capacity of $1\frac{3}{8}$ in. diameter.

ZEUNA-STÄRKER TYPE F + G NIBBLING MACHINE

Zeuna-Stärker K.G., Augsburg, West Germany [Modern Machine Tools, Ltd., 50 Gosford Street, Coventry], have included among their exhibits the type F+G nibbling machine shown in Fig. 4. It is driven by a ½-h.p. motor at a speed of 700 strokes per min., and will cut steel sheets up to 0·1 in. thick. A new type of hold-down device is incorporated which applies pressure to the work-piece, and is released during the return stroke of the tool. In addition, the machine is equipped with an adjustable work support and guide arrangement, which enables single or multiple apertures to be cut accurately in the desired positions. Scales facilitate the transverse and longitudinal adjustments, and positive stops are provided for use in batch production.

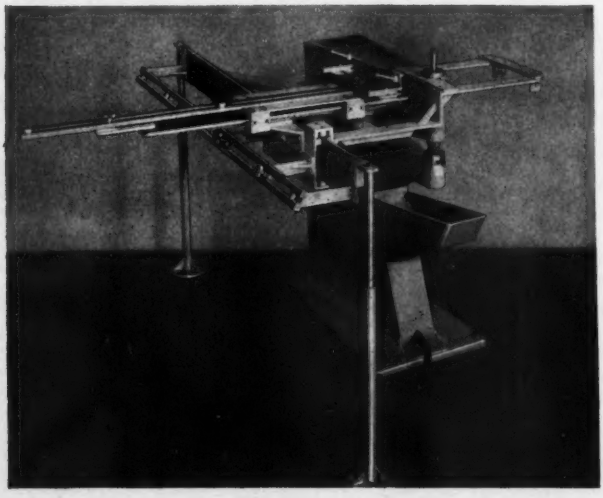


Fig. 4. Zeuna-Stärker type F+G nibbling machine

Attention may also be drawn to the type DHP horizontal duplex press which has steplessly-variable speeds from 33 to 100 strokes per min. Press tools of the follow-on type may be employed, and two different blanks can be produced simultaneously, if desired. Alternatively, blanks produced in one tool can be loaded by hand into an indexing carrier and fed by gravity into a second tool, for forming.

GAMBIN TYPE 1v MILLING MACHINE

The type 1v high-speed precision vertical milling machine shown in Fig. 5 is built by Gambin S.A., Viuz-en-Sallaz (Haute-Savoie), France (Stanhope Machine Tools, Ltd., 202 Acton Lane, Harlesden, London, N.W.10), and is stated to combine high power and rigidity with fairly small capacity. Gambin milling machines are designed on the unit construction principle, and the machine here shown, for example, incorporates the same type of vertical spindle head as is employed on the company's type FAR automatic copy-milling machines. Certain other features are the same as those of the type 1m sliding head machine, including the feed controls. A single lever provides for the reversal of feed and rapid traverse motions, in all directions, and another lever controls the selection and engagement of the longitudinal and transverse feed movements.

Twelve speeds, from 40 to 2,800 r.p.m., are provided for the spindle which has a 40 series nose, and drive is taken from a motor which may be of 4 or 6 h.p., according to requirements. Measuring 46 by 10⅝ in., the work-table has longitudinal and transverse movements of 26¾ and 10¼ in. respectively, and there is a choice of 12½ or 17¾ in. of vertical movement. The distance from the spindle axis to the front of the column is 11 in. from the spindle to the rear of the table (in the forward position), $\frac{5}{16}$ in., and maximum distances between the spindle nose and the table surface of 13¼ or 18¼ in. are offered.

Nine longitudinal and transverse feed rates are available, ranging from ⅝ to 15¾ in. per min., and 9 vertical feed rates from $\frac{3}{32}$ to $3\frac{1}{8}$ in. per min. Horizontal and vertical rapid traverse rates are 80 and 20 in. per min., respectively. The working surface of the table, also all guideways, are heat-treated to 50-53 Rockwell C, and provision has been made for optical table setting equipment.

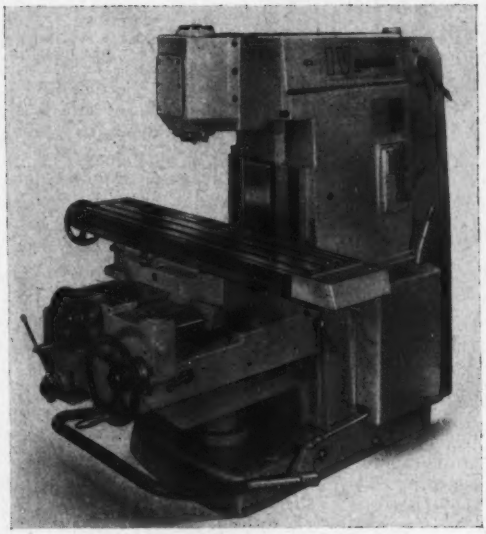


Fig. 5. Gambin type 1v high-speed precision vertical milling machine

Other exhibits shown by this company include the type 2n, which was described in MACHINERY in connection with the 1956 International Machine Tool Exhibition at Olympia; the type 27 s universal machine; a copy-milling machine; and a self-contained copying attachment.

FRORIEP TYPE 6 KZ 200 VERTICAL TURNING AND BORING MILL

A range of double-column vertical turning and boring mills, with work-tables from 69 to 138 in. diameter, has been introduced by Maschinenfabrik Froriep, G.m.b.H., Rheydt (Rhld.), Germany (Charles Churchill & Co., Ltd., Coventry Road, Birmingham, 25), and on the 79-in. type 6 KZ 200 machine seen in Fig. 6, workpieces weighing up to 6 tons can be handled, and the maximum height to the under-side of the cross-rail is 68 in.

The table is carried on a flat annular surface, which is faced with high-grade bearing metal, and the spindle runs in an axially-adjustable double roller bearing. Main drive is taken from a motor that may be of various sizes, between 50 and 60 h.p., and is transmitted through hardened and ground gearing. By means of magnetic clutches, a total of 18 table speeds may be obtained, in a geometric progression, from 1·8 to 90 r.p.m. An automatic system provides for building up the table speed in one or two steps, to prevent damage to the gearing, when drive is engaged after a high rate has been selected, and the speed can be changed during the progress of machining, to enable the cutting speed to be maintained virtually constant. Final drive is transmitted through a pinion and a helical gear ring on the under-side of the table.

The ribbed, box-section cross-rail can be adjusted through a distance of 43 in. on ways at the front of the columns, and is clamped by means of a hand-operated hydraulic system. Diameters up to 91 in. can be turned with the two independently-operated tool heads, each of which may be traversed along the cross-rail ways to a maximum distance of 50 in. from the centre, and the right-hand unit is normally equipped with 5-position indexing turret tool-holder. The vertical slide on which this holder is carried has a traverse of 30 in., and is mounted on a base which can be swivelled up to 30 deg. in either direction. A traverse of 43 in. is provided for the octagonal-section ram in the left-hand head, which can be swivelled through angles of 25 and 35 deg., to the left and right, respectively.

A total of 12 feeds from 0·0028 to 0·197 in. per rev. and a rapid traverse of 79 in. per min. are obtainable vertically and horizontally, and drive is transmitted independently to the heads by means of gearboxes at either end of the cross-rail. Movements are controlled from pendant units, which also incorporate push-buttons for starting and stopping

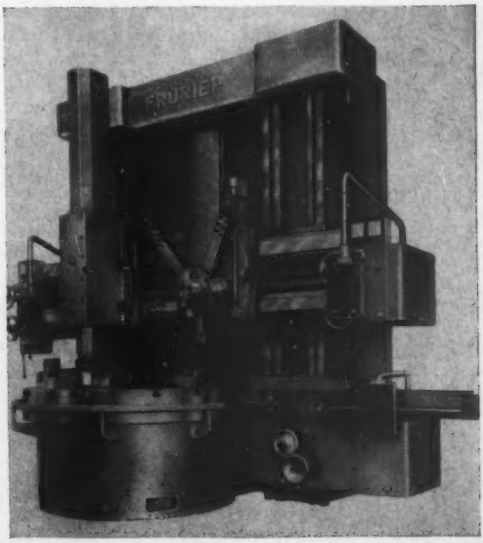


Fig. 6. Froriep type 6 KZ 200 vertical turning and boring mill

the drive to the table, also for changing the speed.

A wide range of extra equipment is available, including an independently-operated, self-contained side head, as seen in the illustration, for turning diameters up to 82 in. The cast steel slide of this unit is provided with a 4-way tool holder, and can be adjusted horizontally for a distance of 36 in. The machine requires floor space of approximately 21 ft. by 14 ft. 9 in., and weighs about 25 tons.

SIG DEEP HOLE DRILLING AND CAM MILLING MACHINES

In Fig. 7 is shown the SIG type B 16/0·5 deep hole drilling machine which is one of a new range introduced by the Swiss Industrial Co., Neuhausen, Switzerland (Dowding & Doll, Ltd., 346 Kensington High Street, London, W.14). This machine has a capacity for drilling holes up to ¾ in. diameter from the solid for depths up to 19⅛ in., and will swing a maximum diameter of 10⅝ in. Either the drill or the work can be rotated, and coolant, which is delivered by a pump driven by a motor of 20 h.p. (maximum), can be directed through the drill or into the space between the drill and the work bore. Various spindle speeds up to a maximum of 6,000 r.p.m. are provided, which enable full advantage to be taken of tungsten-carbide tipped drills, the drive being transmitted from a 7·3-h.p. motor through V-belt and interchangeable pulleys. Steplessly-variable drilling feeds from ¾ to 7⅞ in. per min. are provided by a hydro-mechanical system, and the saddle can be rapidly traversed at the rate of 98½ in. per min.

The drilling cycle can be controlled by push-buttons, or automatically by a timer. When the workpiece has been loaded, the cycle is started by push-button, whereupon the guide bush for the drill is advanced into contact with the end of the piece. Next, the headstock spindle and the coolant supply are started, and drilling is then carried out. When the drill has been advanced to the required depth, the headstock spindle and the coolant supply are stopped, and the saddle is returned to the starting position under rapid power traverse. At the same time, the guide bush is brought clear of the end of the work. If required, an automatic work-holding chuck and equipment for removing cuttings can be provided, also magazine type work-loading and transfer equipment.

A type B 163/0·25 machine is on display fitted with a 3-spindle attachment and set up for drilling small-diameter deep holes in separate workpieces simultaneously. Apart from loading and unloading the workpieces, the machine is automatic in operation. It is fitted with automatic work-holding chucks, and has a capacity for drilling holes up to ¼ in. diameter from the solid, for a maximum depth of 10 in. Drive to the spindles is taken by V-belts from a 2·6-h.p. motor, and a maximum speed of 6,000 is obtainable. Steplessly-variable drilling feeds range from ¾ to 7⅞ in. per min., and rapid power traverse is at the rate of 98½ in. per min.

SIG type HRF 500 and type HRF 250 cam milling machines are also on display. Face-type cams up to 31½ in. diameter can be milled on the former machine, and separate attachments are available for machining cylindrical cams up to 13¾ in. diameter by 15¾ in. long, and worms which may be of constant or varying pitch. An oscillating grinding attachment can be supplied, also a planetary attachment for grinding grooves in hardened steel cams. The horizontal work spindle carries a 19⅛-in. diameter faceplate at the nose end, and a template, from which the cam profile is reproduced on the work, is mounted at the rear end. When milling is in progress, the work spindle is rotated at a speed within

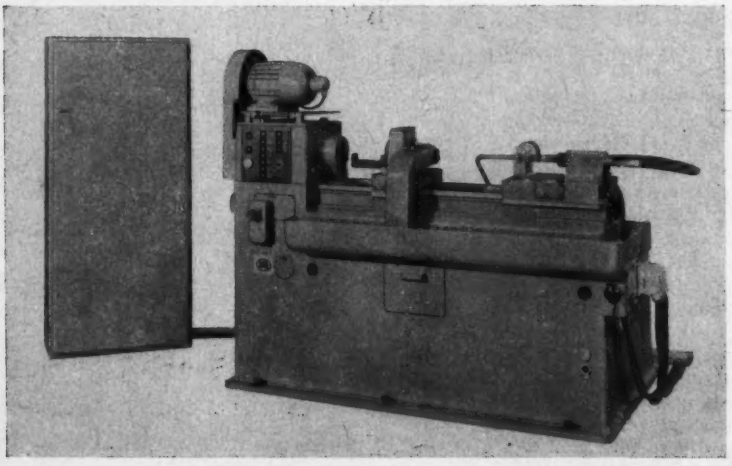


Fig. 7. The new SIG type B 16/0·5 deep hole drilling machine

the range from 0·016 to 0·33 r.p.m., and the cutter head is traversed in the vertical direction on cylindrical guide bars under the control of a hydraulic tracer head. Drive to the cutter head is taken from a 5-h.p. motor, and spindle speeds ranging from 100 to 1,000 r.p.m. are provided.

Of similar design but smaller capacity, the type HRF 250 machine enables milling to be carried out on face-type cams up to 11½ in. diameter. A particular feature of this machine is that the work-head can be swung from the horizontal to the vertical position when cylindrical cams are to be milled, so that the need for a separate attachment is avoided. Drive to the work-head is taken from a 3½-h.p. hydraulic motor through worm gearing, and the spindle speeds range from 0·016 to 2 r.p.m. The cutter head is driven by a 5-h.p. motor, and 13 spindle speeds are normally available, from 100 to 1,600 r.p.m. Alternatively, a P.I.V. drive can be provided, and the steplessly-variable speeds range from 100 to 2,000 r.p.m.

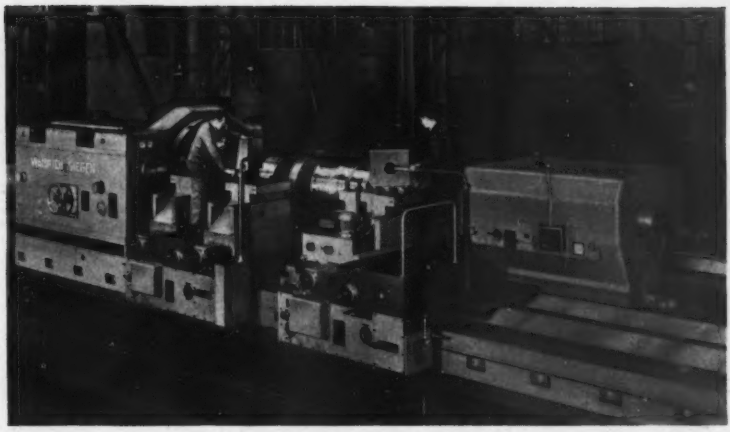


Fig. 8. Waldrich-Siegen WWDK 90 I heavy-duty roll roughing lathe

WALDRICH-SIEGEN WWDK 90 I HEAVY-DUTY ROLL ROUGHING LATHE

In Fig. 8 is shown the WWDK 90 I roll roughing lathe built by H. A. Waldrich, G.m.b.H., Siegen, West Germany (Alfred Herbert, Ltd., Red Lane, Coventry), which has a centre height of 35½ in. and will swing diameters up to 63 in. Workpieces up to 360 in. long and with a maximum weight of 90 tons can be accommodated between centres, and the machine is equipped with motors of a total of 300 h.p. Drive to the headstock spindle is taken through hardened and ground gearing, and speeds from 0·8 to 50 r.p.m. can be obtained.

Two saddles are provided, and for turning roll necks, the cross-slide on the right-hand unit carries holders for three cutting tools, which may be brought into operation simultaneously. Mounted on robust slides, the two holders at the headstock side are clamped in the working position, and may be withdrawn individually. In the remaining holder, the tool is clamped downwards against a deep member, which may be adjusted laterally to provide adequate support when the tool projects for a considerable distance from the front face of the holder. This latter supporting arrangement is also employed for tools in two double-sided holders which are mounted on separate cross-slides on the left-hand saddle. Feed can be applied independently to these slides, which are so positioned that turning can be carried out close to the faceplate or to the tooling on the other saddle.

Hardened and ground steel strips are attached to the bed-ways and the guideways on the saddles, to reduce wear, and provision is made for coupling the longitudinal and cross-feed motions by means of change gearing, to enable both saddles to be employed for turning long, slow tapers. The machine has a total weight of 150 tons.

HERCKELBOUT SPRING COILING, GRINDING AND TESTING MACHINES

The spring-making machinery built by R. Herckelbout & Sons, 77 Rue de Noisy, Rosny-sous-Bois (Seine), France (F. W. Kubach, Ltd., Wakefield House, 106 Church Road, S.E.19), includes the type TC 60 coiling machine seen in Fig. 9, which will handle wire from 0·06 to 0·276 in. diameter. Length of wire fed can be varied from 4 in. to 80 ft., and springs up to 4 in. diameter can be produced. The minimum inside diameter of the spring is two to three times the diameter of the wire. Five linear wire speeds, ranging from 4 to 20 in. per sec., are obtainable. Drive is provided by a 6-h.p. motor, and outputs may range from 12 to 6,000 springs per hour.

A feature of this machine is the use of electronically-controlled clutches which are silent in operation and are claimed to ensure a high degree of accuracy. The clutch that controls the rotation of the two pairs of feed rolls for the wire is coupled to a brake which is applied as soon as the clutch is disengaged, to ensure an accurate feed length. Cutting of the spring is controlled through another clutch and brake, and requires only $\frac{1}{4}$ sec.

Coiling may either be carried out on two pins, in which case the cut-off is vertical, or on one pin, with rotary cut-off. A device, which can readily be fitted, enables torsion springs with tangential branches to be made, and it is possible to produce formed shapes on the branches. The starting branch is limited in length to 4¾ in., but the second branch can be of virtually any length.

For grinding the end faces of compression springs, the type MV 3 machine, with independent upper and lower vertical spindles and a rotating work carrier, is available, as shown in Fig. 10. The resin bonded grinding discs, of 21½ in. diameter, are driven at a speed of 1,500 r.p.m. by 6-h.p. motors, and springs up to 9½ in. long can be handled. Drive to the work plate is taken from a motor of ½ h.p. and the speed is steplessly variable to provide production rates from 200 to 400 springs per hour. The ground springs are discharged by gravity and fall down a chute.

For adjustment of the distance between the two grinding wheels there are large graduated hand-wheels, and a feature of the arrangement is that the wheel spindles can be set at a small angle to the vertical. Also, the dressing device can be so adjusted as to produce an angular face on the wheels, with the result that a progressive grinding action is obtained during the first part of the work traverse, the spring being finally passed between parallel faces on the wheels, which control the finished size. This spindle arrangement, it may be noted, is patented. Springs made from wire up to $\frac{3}{32}$ in. diameter can be ground at a single pass, but for larger wire, several passes may be needed. Coolant is provided.

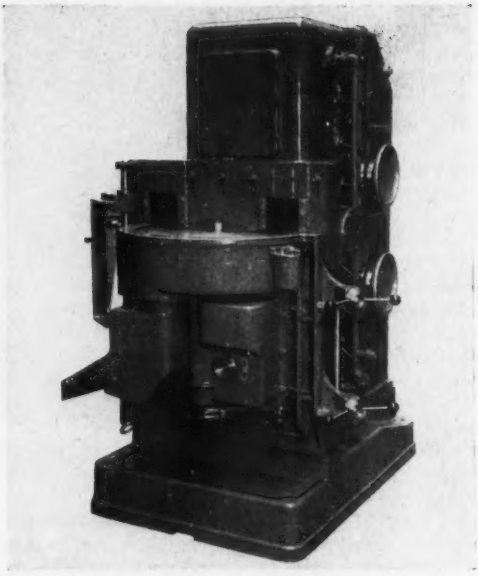


Fig. 10. Herckelbout type MV 3 vertical-spindle spring grinding machine

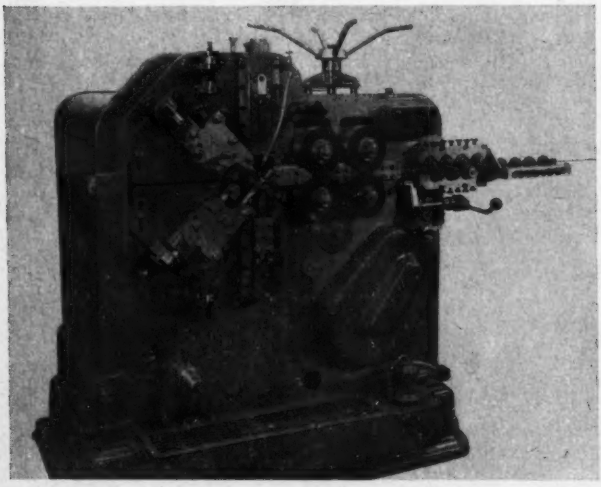


Fig. 9. Herckelbout type TC 60 spring-coiling machine

Spring testing machines made by the company include the type T.E.S. for compression and tension springs. Loads up to 11 lb. or, if required, 22 lb., can be applied. This machine is semi-automatic in operation. Attention may also be drawn to the type M.S. forming machine which can be equipped with a maximum of eight slides and will handle wire up to ⅛ in. diameter or strip of equivalent cross section.

NUTAP NUT FORMING AND TAPPING MACHINES

Built by the German firm of Schuhl & von den Steinen (Robert Speck, Ltd., P.O. Box No. 2, Rickmansworth, Herts.), the type EKMP 10 and type KLP 10 machines shown in Fig. 11 are employed for successive operations required for cold forming blanks for $\frac{5}{16}$- and $\frac{3}{8}$-in. diameter hexagon nuts from hot rolled, rectangular section, steel bar. It is stated that blanks can be produced on the machines at the rate of 110 per min. Squeeze forming to approximately the required hexagon shape is carried out in four stages on the first machine. Partly-formed blanks are then passed to the second machine, which provides for finish forming the hexagon shape and piercing the central hole in readiness for tapping. When blanks are made from certain steels, which are not normally intended for cold forming, annealing of the partly-formed components may be necessary. The amount of scrap which results from the production of blanks on these machines is said to be of the order of 22 per cent of the original weight of the bar.

In Fig. 12 is shown the Nutap type MA-2, 2-spindle, automatic nut tapping machine, which can be supplied for handling nuts with a variety of external shapes, and thread diameters of $\frac{5}{16}$, $\frac{3}{8}$, and $\frac{1}{2}$ in. Nuts of $\frac{5}{16}$ in. diameter can be handled at the rate of 1,900 to 3,050 per hour, and those of $\frac{1}{2}$ in. diameter, at the rate of 1,250 to 2,000 per hour, depending upon the tapping speed employed. There is a variable-speed drive for the tapping spindles, which are brought into use alternately, and accurate pitch control, also rapid traverse movements are provided by separate barrel-type cams. A nut which has a thickness of 0·8 times the thread diameter, is tapped in 40 spindle revolutions. Rapid traverse is imparted to the spindle during the first four revolutions in the cycle to bring the end of the tap close to the nut, and the threads are cut to the full depth during the next 25 revolutions. A full-form portion of the tap is passed through the nut during the succeeding 5 revolutions, and further axial movement imparted to the spindle during the next 2 revolutions ensures that the cutting portion is brought clear of the nut. Finally, the spindle is rapidly returned to the starting position.

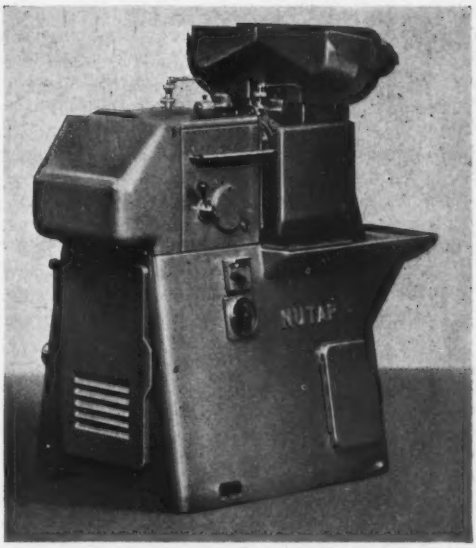


Fig. 12. Nutap type MA-2, 2-spindle automatic nut tapping machine

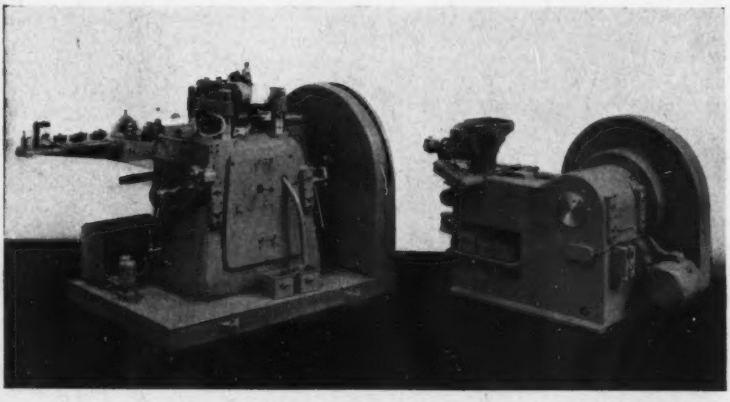


Fig. 11. These machines, built by Schuhl & von den Steinen, are designed for cold forming nut blanks from hot rolled, rectangular section steel bar

Nut blanks from two hopper feed units are passed vertically between pairs of guide pieces, and the blank at each tapping position is located—but not gripped—between a gate and a spring-loaded jaw. During the working cycle, the blank is held

in contact with the end face of a hardened steel bush by the action of the tap, to ensure that the threads are cut accurately square. When the end of the tap has passed through the blank it engages with a centring arrangement, to prevent wobble. A probe is advanced with each tap spindle, and enters the bore of the next blank in the guide pieces. If the probe is obstructed, an adjustable safety clutch in the drive to the cam is disengaged to stop the axial feed. Taps of the bent shank type are employed, and the nuts are discharged radially by centrifugal action, and directed into a container beneath the spindle head.

A type MA-5, 2-spindle automatic nut tapping machine, which will handle nuts from 1⅛ to 2 in. diameter, has recently been added to the range, and is being shown. Blanks from a single hopper are delivered to a special gripping arrangement, which presents them to the taps. The blanks are rotated during the tapping cycle, and pitch control is provided by a cam.

Nutap single spindle machines are intended for tapping square and hexagonal nuts only, and are made in two sizes, the smaller of which will handle nuts of ⅛, $\frac{7}{16}$, and ¼ in. diameter at rates of 2,330, 1,840, and 1,400 per hour. Nuts of $\frac{7}{16}$, ⅝, and $\frac{7}{8}$ in. diameter can be tapped on the larger machine at rates of 1,200, 930, and 700 per hour.

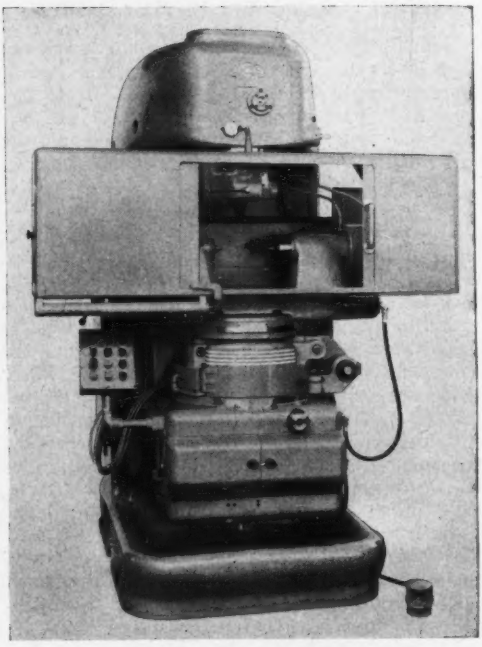


Fig. 13. Sicmat type SSU 310 universal gear shaving machine

SICMAT TYPE SSU 310 UNIVERSAL GEAR SHAVING MACHINE

Fig. 13 shows the type SSU 310 universal gear shaving machine which is one of a range made by Stabilimento Industriale Construzione Macchinario Attrezzature Torino, Turin, Italy. Shaving can be carried out by the conventional, diagonal, and underpass methods, on gears from 1 to 12 in. diameter, and up to 3 d.p. Shaving cutters from 7 to 9 in. diameter and up to 4¼ in. face width can be employed, and 14 speeds, from 57 to 228 r.p.m., are provided by change gears. Drive is taken from a 4 h.p. motor.

The shaving cutter head can be adjusted up to 25 deg. in each direction, about a vertical axis, and a vernier scale is fitted for accurate setting. Provision is also made for checking the setting by means of gauge blocks, and a dial indicator. The maximum longitudinal travel of the work-table is 4¾ in., the stroke being determined by two adjustable dogs which actuate a reversing switch. A motor of 1 h.p. is employed for the traversing drive.

After the workpiece has been loaded, the air-operated headstock and tailstock are locked in position by pressing a button, and when another button is pressed, the air-operated splash guards are closed, and the cycle starts. First, the knee is moved rapidly upwards by a motor of 0·45 h.p., to bring the work into engagement with the shaving cutter, and the work-table makes a predetermined number of strokes while vertical feed is applied by a ratchet mechanism. The feed motion is driven by a 1-h.p. motor and each ratchet tooth represents a feed increment of 0·001 in. When the required amount of vertical feed has been applied the table continues to reciprocate for a number of strokes, to complete the cycle, and stops. Finally, the knee moves rapidly downwards, and the splash guards are opened automatically. A rocking motion is incorporated in the knee, which enables crown shaving to be performed.

LOEWE TYPE DLZ 400 PRECISION CENTRE LATHE

The type DLZ 400 precision centre lathe made by Ludw. Loewe & Co., West Berlin (George H. Alexander Machinery, Ltd., 82-84 Coleshill Street, Birmingham 4), is shown in Fig. 14. It has a turning capacity of 16 in. diameter over the bed, and 9 in. diameter over the carriage, will admit 44 in. between centres, and has a maximum turning length of 40 in.

Twenty-one spindle speeds from 18 to 1,800 r.p.m. are provided by the geared headstock, the drive being taken from a motor of 7½ h.p. The spindle is bored 2⅛ in. diameter and has a No. 6 Morse taper at the nose end, which conforms to DIN 55022 No. 6. Sixty rates of sliding and surfacing feed are available, the former ranging from 0·0009 to 0·035 in. per rev., and the latter from 0·00045 to 0·0175 in. per rev. Metric threads from 0·2 to 120 mm. pitch can be cut, and inch threads from ¼-in. pitch to 60 t.p.i. Module and diametrical pitches in corresponding ranges can be cut, and gears are incorporated for producing very coarse and very fine pitches. The accuracy of the leadscrew is stated to be within 0·0008 in. over a length of 12 in. or, if required, within 0·0004 in. over a length of 12 in.

A taper turning attachment for internal or external tapers up to 10 deg., and of a maximum length of 17½ in., can be provided, which may be mounted at any position at the rear of the bed. A hydraulic duplicator is also available which has a swivel slide for longitudinal, transverse, and internal copying. With this unit, right-angle shoulders facing the tailstock, increasing tapers of any angle, decreasing tapers up to 30 deg., and radii and fillets can be produced at one pass. Work up to 16 in. diameter can be handled and the copying accuracy is stated to be within 0·0008 in. The addition of a synchronized drive for the master enables inside and outside non-cylindrical profiles, such as polygons, cams and eccentrics, as well as profiled end faces, to be reproduced. The maximum turning diameter with this arrangement is 8 in. Rapid traverse in both directions, at the rate of 20 ft. per min., can be provided for the carriage by means of an independent motor at the rear. When the lathe is equipped for copy turning the tracer and tool are retracted automatically before the carriage returns under rapid traverse. A coolant system can be incorporated if desired.

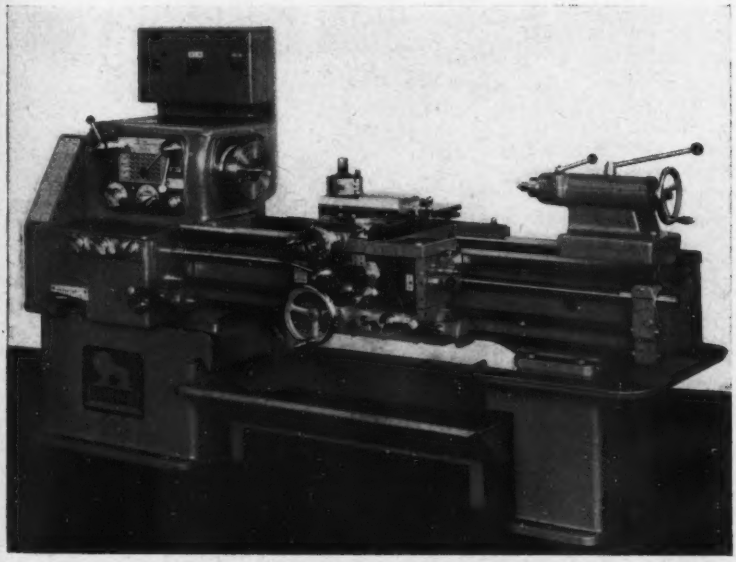


Fig. 14. Loewe type DLZ 400 precision centre lathe

GRAFFENSTADEN TYPE FH142 HEAVY-DUTY HORIZONTAL MILLING MACHINE

The range of milling machines made by Société Alsacienne de Constructions Mecaniques, Graffenstaden, France (Acbars, Ltd., 331-333 Walworth Road, London, S.E.17), includes the heavy-duty plain horizontal type FH142 shown in Fig. 15. This machine has a 76½- by 19-in. table with longitudinal and transverse traverses of 55⅛ and 17¾ in., and a vertical travel of 23⅝ in. A backlash eliminator for the table lead screw and nut is incorporated to enable climb milling to be performed, and there is a centralized lubrication system.

Drive to the spindle is taken from a motor of 32 h.p., and the 36 speeds, which are selected by a single dial, range from 16 to 1,400 r.p.m. The spindle nose has a No. 50 American taper and the maximum distance from the spindle axis to the table working surface is 24⅞ in. Power feed and rapid traverse are available in all directions, the drive being provided by a 5-h.p. motor. There are 32 rates of feed, ranging from 0·315 to 78·7 in. per min. longitudinally and transversely, and 0·078 to 19·7 in. vertically. Rapid traverse is at the rate of 10 ft. per min. longitudinally and transversely and 29½ in. per min. vertically. Vernier scales are fitted to facilitate accurate table setting, and there is provision for operation with an automatic cycle of longitudinal movements under the control of adjustable dogs.

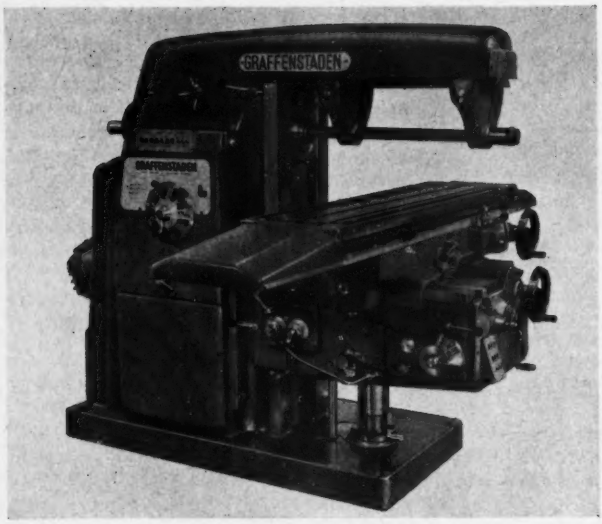


Fig. 15. Graffenstaden type FH142, heavy-duty, horizontal milling machine

Additional equipment available includes a heavy-duty vertical milling attachment with the same speeds as the main spindle, and a No. 50 American nose; a circular dividing attachment with a 19¾ in. diameter table; a power or hand-operated rotary table of the same diameter; and precision scales and optical reading devices for the two table movements.

The machine can also be supplied with the Hyper ram-type, fully-universal milling head with independent drive by a 10-h.p. motor. Eighteen spindle speeds from 40 to 2,000 r.p.m. are then available, and the spindle has a No. 50 American taper nose. The manually-operated travel of the spindle quill is 3⅛ in.

MULLER TYPE SR 30 RADIAL ARM DRILLING MACHINE

Otto Muller, Plochingen/Neckar, Germany (B.P.S. Machinery & Spares Co., Ltd., 245 Knightsbridge, London, S.W.7), have introduced the type SR 30 radial arm drilling machine, which can be arranged for suspension from an overhead structure or mounted on a T-slotted, rectangular-section base, for use in conjunction with a table unit with a T-slotted working surface measuring 45⅞ by 16 in., as shown in Fig. 16. The total weight of this equipment is approximately 1½ tons. Developed from the company's type SR 23, which is also on display, the machine has a capacity for drilling up to 1 and 1¼ in. and tapping up to 1⅛ and 1⅜ in. diameter in steel and cast iron, respectively, at radii from 13⅞ to 40 in.

Steplessly-variable speeds, which normally range from 90 to 1,400 r.p.m., are obtainable for the spindle, which is bored No. 3 Morse taper, drive being taken from a 2-speed motor through a transmission which is controlled by means of a lever on the head. An adjacent dial indicates the speed in use, and the direction of drive can be reversed up to 8 times per min. for tapping. The spindle has a stroke of 8 in. and can be traversed by hand lever, or at feed rates from 0·003 to 0·01 in. per rev. By means of a selector switch at the front of the head, the machine can be set for drilling or tapping under either manual or automatic control, and adjustable trips for engaging and disengaging drilling feed are provided at the right-hand side.

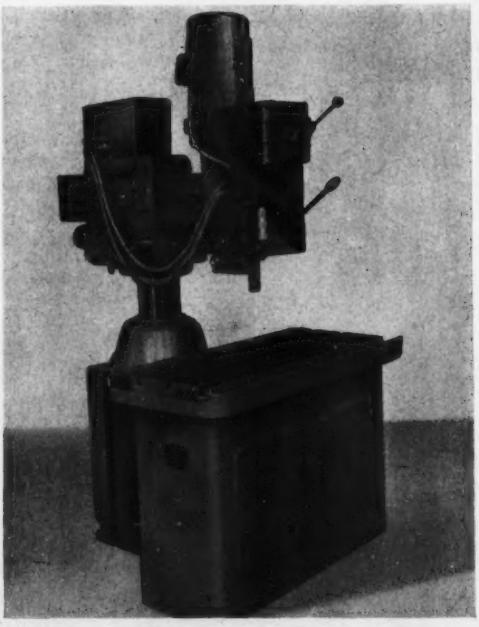


Fig. 16. The Muller type SR 30 radial arm drilling machine is here shown mounted on a T-slotted base and equipped with a work-table unit

The steel arm which carries the head can be supplied hardened and ground, if required, and it is guided by adjustable rollers mounted in a housing at the top of the 7-in. diameter column, which is also of steel. This column can be adjusted vertically in the supporting sleeve at a rate of 1·4 in. per sec. by means of a separate 1-h.p. motor. A total travel of 16 in. is provided, and a maximum distance of 19⅛ in. is obtainable between the spindle nose and the surface of the work-table.

The arm can be swung through 360 deg. about the column axis, movements in the horizontal plane being obtained manually by means of a handle, arranged vertically in a recess in the head. For ease of operation, this member also provides for controlling vertical movement of the column, and altering the direction of rotation of the spindle. Conveniently-placed levers, which may be operated without releasing the handle, control the application of clamps for the sliding and swivelling movements of the arm, and the engagement of feed.

Described in MACHINERY, 96/1591—29/6/60, the proving press, which is also being shown, has working surfaces of 39 by 24 in. and 39 by 14 in. on the fixed lower and trunnion-mounted upper platens, respectively, and the latter member can be lowered by hand or power, to exert a force of 15 or 7½ tons.

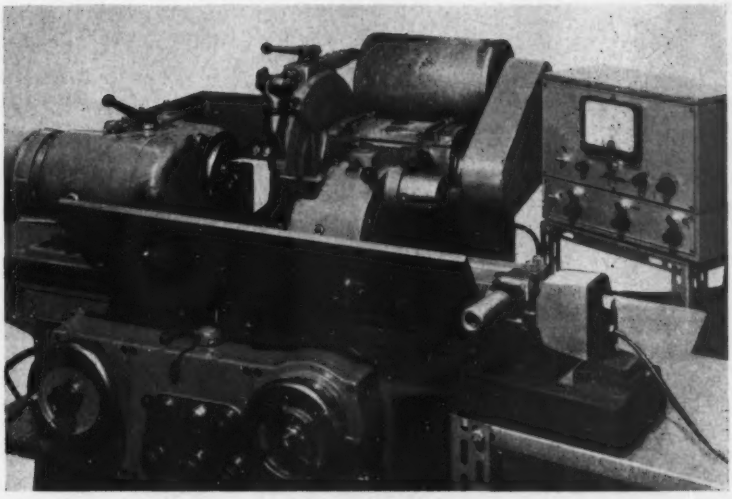


Fig. 17. An application of Marposs internal and external gauges for matched grinding

MARPOSS ELECTRONIC GAUGING EQUIPMENT

Electronic gauging and control equipment made by Apparecchi Elettronici Marposs, Bologna, Italy (Machine Tool Sales, Ltd., 79 Portland Place, London, W.1), is shown in Fig. 17 applied to a cylindrical grinder for producing an external diameter to a specified fit in the bore of a selected mating workpiece. The Dirac unit for internal measurement, seen on the right, adjacent to the meter, has a capacity for bores up to 76 mm. diameter (3 in.). The Finar unit, mounted on the table, which stops the machine when the work has been ground to size, has a capacity of 2 in. diameter, and is inter-connected with the Dirac unit.

The wide range of equipment made by the company also includes the pivoted-arm, swing-down, Convar gauge for measuring widths, and the type CFAC swing-down gauge, which is supplied with four interchangeable and adjustable caliper members, for measuring diameters from 0·315 to 8 in. Readings to 0·00004 in. can be obtained with these gauges.

DORMER PROFILE TOOL AND CUTTER GRINDING MACHINE

The Sheffield Twist Drill & Steel Co., Ltd., Summerfield Street, Sheffield, 11, have introduced the Dormer profile tool and cutter grinder shown in Fig. 18, which enables peripheral form grinding to be carried out under template control, and can also be employed as a conventional universal tool and cutter grinder. Cutters up to 14 in. diameter are accommodated, and the maximum distance between the work centres to 14 in. Grinding wheels up to 6 in. diameter can be fitted, and drive is taken from a ¾-h.p. reversing motor, speeds of 3,850 and 2,850 r.p.m. being obtainable.

For form grinding, a simple radial movement is imparted to one hand lever. The resulting biased linear motion of the roller-mounted main slide ensures that contact between the template and follower is maintained, and the required profile is automatically reproduced. With the peripheral form grinding method, it is claimed, there is a minimum variation of clearance angle along the

Fig. 18. Dormer profile tool and cutter grinding machine, for cutters up to 14 in. diameter

entire tooth profile. Moreover, a minimum amount of metal is removed during sharpening, and modifications can be made to existing profiles, if required. The machine can also be employed for re-gashing chip clearances.

The vernier settings available on the machine enable profiles incorporating angles and radii to be ground without the use of a template. These settings can also be employed for diamond dressing the wheel profile for sharpening cutters by plunge grinding. A sine bar attachment for generating spirals, and a motorized work-head for cylindrical grinding, are available as additional equipment. Flat and circular form tools can be ground, and it is also possible to produce a hardened template by the use of a soft master.

In addition to the motorized work-head, a universal head is available which has an indexing collet spindle and angular adjustment in two planes, and enables plain or formed end milling cutters to be sharpened.

KIESERLING & ALBRECHT BAR TURNING AND TUBE STRAIGHTENING MACHINES

Centreless bar turning machines in the WDH range built by Th. Kieserling & Albrecht, Solingen, Germany (F. W. Kubach, Ltd., 106 Church Road, London, S.E.19), are available in various sizes which will handle steel bars down to 0·32 in. diameter. An example from the range is shown in Fig. 19. On the size 0 machine, for instance, ⅜ in. diameter steel bars which have a tensile strength of 41 tons per sq. in. can be turned at a maximum traversing speed of 26 ft. per min. The maximum traversing speed obtainable for turning 1⅛-in. diameter steel bars is 14 ft. per min.

Four interchangeable cutter heads are provided for each machine to cover the range of bars that can be handled. Of cone shape, to facilitate the removal of cuttings, each cutter head is fitted with a chip breaker, and is attached to the hollow spindle by a bayonet mounting arrangement. Carried in roller bearings, the cutter spindle is accurately balanced to ensure freedom from vibration when the machine is in operation, and steplessly-variable speeds are provided, the drive being taken through belts and a PIV gear. A powerful spindle brake is fitted. Non-rotating roller guides are mounted at the front and rear of the head close to the point of cutting, and are held in contact with the work bar by spring action.

Bars to be turned are loaded on to an inclined rack at one end of the machine, and the leading bar is held by a stop. This bar is lifted clear of

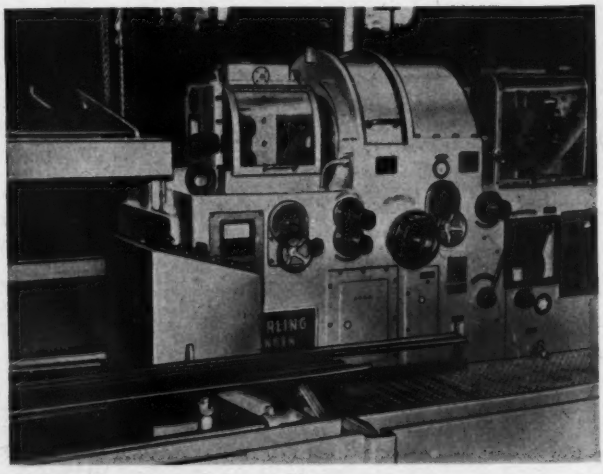


Fig. 19. An example from the Kieserling & Albrecht WDH range of centreless bar turning machines

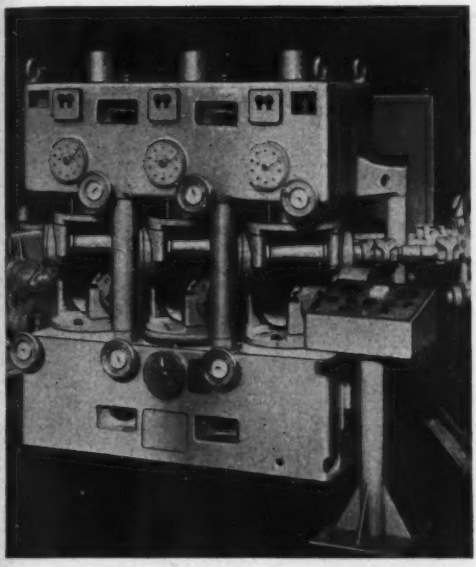


Fig. 20. Kieserling & Albrecht type VRM tube straightening machine. These machines are made in nine sizes with capacities for work ranging from ⅛ to 10 in. diameter

the stop by a lever and transferred to a channel-shaped guide, whence it is passed through the cutter head by two pairs of feed rolls, which can be driven at steplessly-variable speeds and reversed if required. The bar is pulled clear of the cutting head as turning proceeds by other rolls at the discharge end of the machine, and is directed into a tray. When the bar has been turned for its entire length, it makes contact with a stop, and is discharged from the tray on to a second inclined rack.

In Fig. 20 is shown one of the company's type VRM tube straightening machines which are made in nine sizes with diameter capacities from ⅛ to 10 in. These machines may be used for straightening thin-wall tubes in steel and non-ferrous metals. The upper and lower members of the cast iron frame are connected by large-diameter shrunk-in tie rods, and between them are mounted three pairs of concave straightening rolls, the journals of which run in needle roller bearings on the smallest machine in the range, and in self-aligning roller bearings on the larger sizes. The roll assemblies can be swivelled independently in the horizontal plane for setting to the required angle for straightening. There is provision for adjusting the upper rolls and the lower central roll for height, while the machine is in operation if required. On the larger machines in the range, this adjustment is effected by a motor drive.

A single operating speed is normally provided, but a 3-speed drive can be supplied. Rolls in the upper and lower sets are driven by separate motors, through gearboxes and universally-jointed shafts.

BROOKE ROTARY TRANSFER MACHINES

Built by Brooke Tool Automation, Ltd., Aldridge Road, Perry Barr, Birmingham, 22b, the type UHX.60, centre column, rotary transfer machine, shown in Fig. 21, occupies comparatively little floor space, and can be set up for handling various types of components. It incorporates a patented indexing mechanism, which enables a maximum of nine working stations to be obtained. Unit heads of various sizes from the Brooke range can be mounted on individual saddles, which are secured by T-bolts to the cylindrical column. With this arrangement, different numbers of unit heads can be fitted, depending upon the operations to be carried out on the work, and they can be readily set in various positions to suit the indexing angle. If required, other unit heads can be mounted horizontally on wing bases, which can

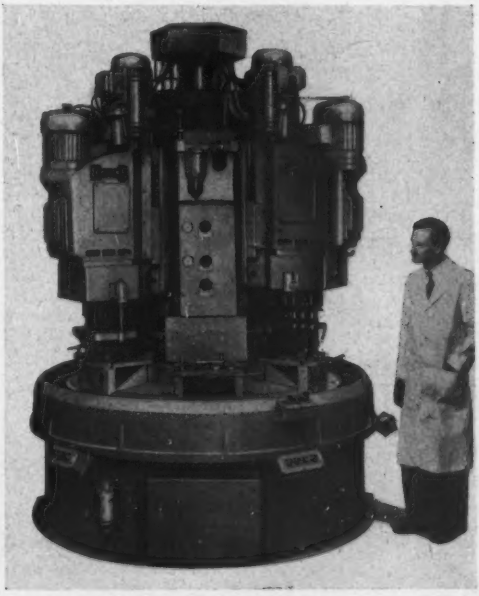


Fig. 21. Brooke type UHX.60 centre-column rotary transfer machine

be secured in the required positions round the base.

A new type UHX. 20 rotary transfer machine which is being exhibited is particularly intended for operations on small components, and has five Model CH.00 unit heads mounted on external columns. Each head is driven by a ¾-h.p. motor, and feed is imparted to the spindle quill by a cam mechanism. A full range of unit heads is also being shown, the largest of which, designated type UH.33, can be fitted with a driving motor of 10 or 15 h.p., and has a screw feed arrangement.

Another exhibit is the new Brooke type BMS fine boring machine, which has a hydraulic feed system for the work table, and can be supplied in single- and double-ended designs.

S.M.G. HYDRAULIC PRESSES AND TRIMMING MACHINES

The hydraulic presses made by Sueddeutsche Maschinenbau-Gesellschaft M.b.H., Bruchsal, West Germany (Pearson Panke, Ltd., 1-3 Hale Grove Gardens, London, N.W.7), have been the subject of a number of improvements. For example, a block system for the hydraulic controls has considerably reduced the number of pipes, and provides for easier maintenance. Circuit modifications have been made to ensure smoother change-over from the rapid approach movement to the slower working stroke, and it is stated that the ram can be reversed without shock, even under full pressure. On the double-sided presses, a system of fine adjustment for the ram, in millimetre steps, is provided by means of a hand crank, which facilitates tool setting.

Fig. 22. S.M.G. type HZPUX treble action hydraulic press of 700 tons capacity

Fig. 23. An example from the range of S.M.G. trimming machines

In Fig. 22 is shown the type HZPUX treble action drawing press with a total capacity of 700 tons, and a distance between uprights of 80 in. This press is particularly intended for producing complicated pressings of rectangular or irregular shapes. Double action is obtained from above, and the blank holder arranged below the drawing ram takes the place of the drawing cushion fitted in the table of the firm's type HZPU press. As compared with the latter arrangement, the blank holder on the press illustrated affords the advantage that the pressure can be independently controlled at the four corners. As a result, the pressure applied around the periphery of the work can be varied as required.

By fitting a hydraulic drawing cushion, a treble

action is obtained, and if double action from above is utilized, the drawing cushion serves as the ejector. If the blank holder and the ram are coupled together, the blank holding pressure is obtained from the drawing cushion, and the entire ram force plus 80 per cent of the blank holder force is available for the working stroke.

Machines from the company's VZP range, which can be employed in the same manner as the type HZPU, incorporate a simplified hydraulic system with electrical control. The type HZPU and HZPUX presses, however, have reversible drive for greater versatility in application and convenience in setting. In addition they are provided with mechanical, hand lever control systems.

The company also makes trimming machines, as shown in Fig. 23, for round, rectangular and irregular-shaped components. Types B.S.I and B.S.II are suitable for light work, the latter having a capacity for sheet thicknesses up to 0·08 in. for rectangular and irregular workpieces, and 0·120 in. for round parts. Forming and beading operations can often be combined with trimming, and it is stated that outputs up to 500 pieces per hour can be obtained. A type B.S.III machine has recently been introduced for handling larger components, for example, rectangular shapes with diagonal dimensions up to 33½ in.

V.D.F. LATHE DEVELOPMENTS

Machines recently introduced by the V.D.F. Group of German companies (Sykes Machine Tool Co., Ltd., The Hythe, Staines, Middlesex), include the type M 1250B × 600 heavy-duty centre lathe shown in Fig. 24, which is built by H. Wohlenberg K.G. It has a centre height of 24¾ in., and the maximum turning length is 19 ft. 6 in. Drive to the headstock is taken from a motor of 53 to 84 h.p., according to requirements, and 36 speeds, from 1·12 to 315 r.p.m., are available in three ranges. For the low range, from 1·12 to 14 r.p.m., the drive is transmitted to a faceplate rim gear, and for the medium range, from 18 to 224 r.p.m., through a gear on the spindle. Direct drive by flat belt is employed for the remaining speeds, from 25 to 315 r.p.m. The spindle is mounted in double roller bearings, with a thrust bearing to take the axial load, and it is bored 3·15 in. diameter.

Steplessly-variable sliding feeds from 0·012 to 28 in. per min., and surfacing feeds from 0·006 to 14 in. per min., are obtainable, together with rapid traverse in each direction. The required motion is pre-selected by movement of a single lever, and then engaged by pressing a button. To reduce frictional resistance, the long guiding surfaces of the saddle are lined with laminated plastics.

This company has also introduced the type E850 × 3000 centre lathe of 16¾-in. centre height, with a turning length of 10 ft. A driving motor of 29 to 37 h.p. can be provided, and 18 spindle speeds, from 5·6 to 280 r.p.m., are available through gears, and 12 speeds, from 90 to 1,120 r.p.m., by direct belt drive. There are 56 rates of feed, which range from 0·004 to 2·2 in. per rev. for sliding, and 0·002 to 1·1 in. per rev. for surfacing. As on the M 1250B × 600 lathe, the guiding surfaces of the saddle are lined with laminated plastics.

Gebr. Boehringer, G.m.b.H., have introduced Hydrocop out-of-round copying equipment with master shaft drive, which is seen in Fig. 25, applied

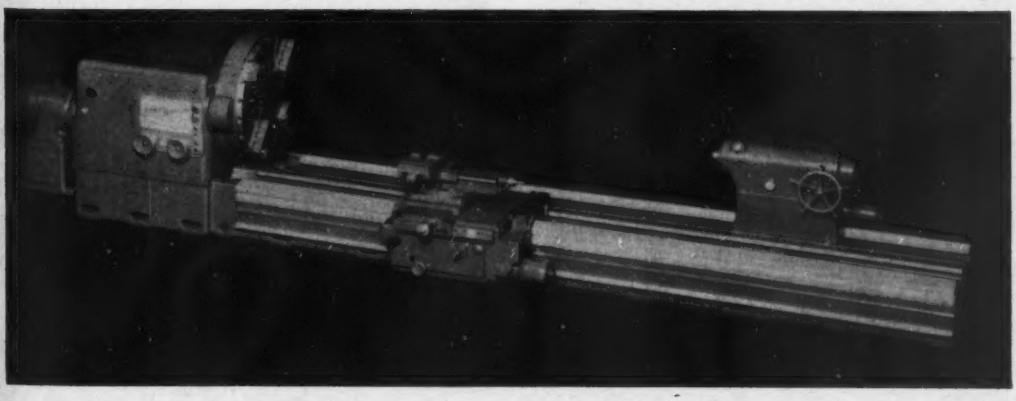


Fig. 24. V.D.F. type M 1250B × 600 heavy-duty centre lathe

Fig. 25. Rear view of a V.D.F. type V5 standard centre lathe with out-of-round copying equipment

to a type V5 V.D.F. standard lathe having a swing capacity of 26¾ in. diameter over the bed. With this equipment, polygon forms with a maximum inclination angle of the profile cross section of approximately 45 deg. can be copied. The equipment can also be used for normal longitudinal and transverse copying operations. Workpieces that can be handled include, for example, cams, conveyor worms and pump rotors. A device is incorporated in the hydraulic system which ensures the immediate withdrawal of the copying slide should a power failure occur, to prevent damage which might otherwise be caused to the machine or the work.

ECLIPSE PERMANENT MAGNET CHUCKS

The range of Eclipse permanent magnet chucks made by James Neill & Co. (Sheffield), Ltd., Napier Street, Sheffield, has recently been extended by the addition of a circular type, of 15 in. diameter. These chucks are widely employed for work holding, and an interesting application is shown in Fig. 26. Here, a rectangular chuck is clamped to the side face of the box table on a radial drilling machine and serves to hold a casting while holes are drilled through the top edge and central web. The workpiece is supported on two blocks which are clamped in the table T-slots, and take the drilling thrust.

Another product to which attention may be drawn in the Eclipse permanent electro-magnetic chuck. This chuck, of patented design, incorporates a number of magnets, which are saturated, when a workpiece is to be gripped, by current applied momentarily to the surrounding coils. A high gripping force is obtained, which is sustained entirely by residual magnetism. To release the workpiece, the current is again applied momentarily, but in the reverse direction. Since current is applied to the coils only for a very short time, there is virtually no heating, and

Fig. 26. Application of an Eclipse permanent magnet chuck for holding work on a radial drill

risk of distorting the working surface is thus avoided. The spaces between the pole pieces on the laminated working surface, it may be noted, are of different widths. As a result, thin workpieces can be firmly held by the closely-spaced pole pieces, and a fairly high "magnetic throw" is provided for gripping parts which have rough surfaces, or of metals which are usually difficult to hold magnetically.

RAVENSBURG TYPE SL500 SLOTTING MACHINE

In Fig. 27 is shown the type SL500 slotting machine built by Maschinenfabrik Ravensburg A.G., Ravensburg, Wurttemberg, West Germany (Sykes Machine Tool Co., Ltd., The Hythe, Staines, Middlesex). It can be supplied with a maximum ram stroke of either 20 in. or 39⅜ in., and the ram head can be swivelled laterally in the column. The ram is driven through a pinion and rack by a 10 h.p. motor with Ward-Leonard control, at a speed which is variable from 11 to 60 strokes per min., and a rotary switch provides for accurate reversing. An adjustment of 20 in. is provided for the ram, and the throat depth from the front of the ram to the machine column is 37 in. If desired, a built-in automatic tool lifting mechanism can be provided.

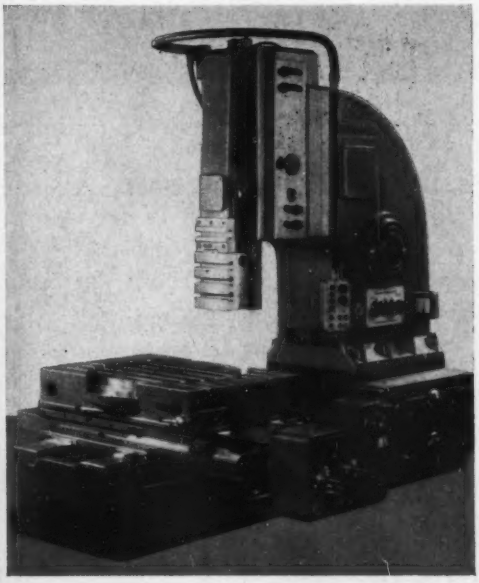


Fig. 27. Ravensburg type SL500 slotting machine

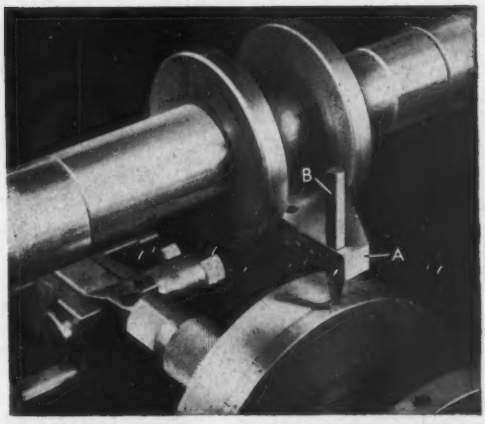
The T-slotted, 39-in. diameter table has longitudinal and transverse travels of 39 and 29 in. A Geneva stop is incorporated in the feed drive, and gear changes provide six rates longitudinally and transversely, ranging from 0·0046 to 0·047 in. per ram stroke. The circular feeds per ram stroke range from 0·0016 to 0·016 in. on a diameter of 4 in. If required, rapid traverse can be provided for the table in all directions by a separate motor. A dividing plate and manual drive is incorporated for the rotary table which enables any desired number of index positions to be obtained. The machine is controlled from a movable pendant station.

Milling Machine Set-up for Marking Dials

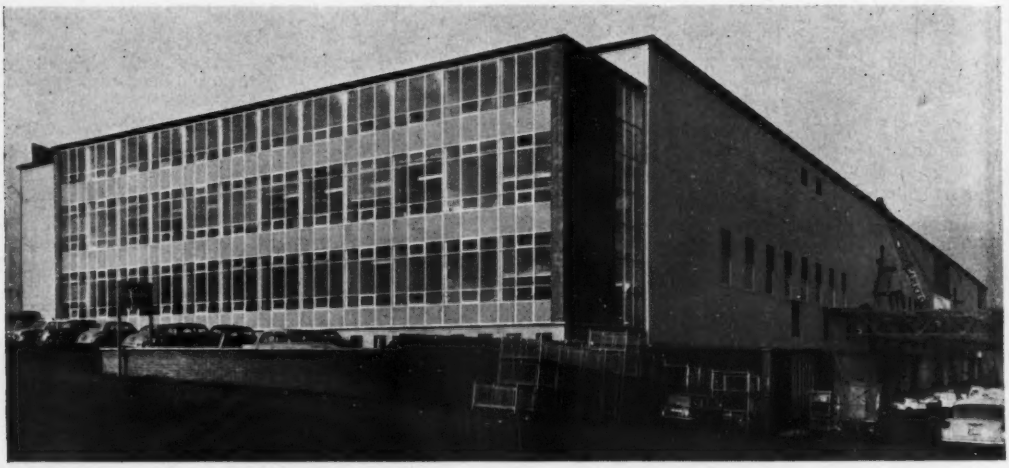
By H. J. GERBER

For graduating various kinds of dials required in only small quantities, the installation of special machines, or the production of marking dies, is not usually justified. An improvised set-up for performing such an operation on a horizontal milling machine, is shown in the figure.

The dial to be marked is held on a mandrel mounted between the centres of a dividing head. A special stamp holder, which is seen at *A*, is clamped between the knurled inner faces of two case-hardened steel discs, mounted on the machine arbor. The holder is of hardened steel, and it incorporates an accurately-ground slot wherein the stamp *B* can slide vertically. A flat spring bears against one side of the stamp, to hold it in position. The standard stamps employed are surface ground on the sides. Marking is effected by a sharp hammer blow on the stamp.



Milling machine set-up for marking dials



The New Standard-Triumph Vehicle Assembly Hall

Details of the Building at Canley, Coventry, in which the Triumph Herald, Standard Vanguard, and TR Sports Cars are now being Assembled

By A. W. ASTROP, Associate Editor

DESIGNED TO PROVIDE A MAXIMUM OUTPUT OF 5,000 VEHICLES per week, the new Standard-Triumph assembly hall at Canley, seen in the heading figure, has been in use for about 6 months and proving trials have been successfully completed. Built at a cost of £2,500,000, the hall has three levels—a basement, and first and second floors—and provides a total floor space of 508,040 sq. ft. The basement serves as a component stores, has a floor area of 140,000 sq. ft., and contains stocks of every item required to complete vehicles from the fully-painted and trimmed body shells. These shells are stored and marshalled on the top floor, which has a complex system of longitudinal and transverse conveyors, and are lowered to the centre floor by way of hoists. Components are raised from the basement to the centre floor by a number of strategically-placed lifts, and with this arrangement the three body-building lines on this floor are continuously fed with body shells and component parts. The assembly floor has an area of 213,840 sq. ft., and there are separate, parallel, building lines, for Herald, Vanguard, and TR type cars. The Herald line, on which the assembly procedures are typical, is described later in this article.

An outstanding feature of the installation is the marshalling area on the top floor which is controlled entirely from a room in the basement. Fully-painted and trimmed body shells are automatically delivered to this area from two sources—namely, from an adjacent trimming and painting shop, and from outside suppliers—and are directed by remote control into what are termed "beds." These beds, each of which has a capacity for eight or ten bodies, are filled in a pre-selected order, and can then be emptied in the same order—or in a different order—as required. Bodies from the beds pass to a Mansaver hoist (Geo. W. King, Ltd., Stevenage, Herts.), whereby they are lowered directly on to the assembly lines.

A general view of a portion of the top floor is given in Fig. 1, from a position about half-way

along the length, and shows what is termed the "programmed area" for Herald bodies. It is in this section that the bodies are marshalled and stored in a predetermined order, and are subsequently moved automatically, in a direction away from the camera, to the Mansaver hoist, which is located at the far end. There is another area, of approximately the same size, behind the camera in Fig. 1, which is used for general storage of Herald bodies. Body shells from this area can either be moved into the programming section, or can bypass the latter and proceed straight to the Mansaver. All the longitudinal conveyors are of the power-driven roller type, and were designed and built by Standard-Triumph, and there are transverse conveyors of the chain-type between the beds. Similar programming and general storage areas for Vanguard and TR bodies are provided parallel with those for the Herald, and are situated to the right of that shown in Fig. 1.

THE MARSHALLING AREA

A diagrammatic plan of the top floor of the assembly hall is shown in Fig. 2, where the various areas and the longitudinal and transverse conveyors are indicated. The two feeding points for the marshalling area are at *D* and *E*, the former being a receiving area for fully-painted and trimmed bodies supplied from outside. This rectangle *D* is a covered area on the ground floor, projecting from the main outline of the building, into which lorries are driven, and the body shells are lifted by hoist to the top floor and fed on to the transverse conveyor *F*. From this conveyor, they are distributed to the three longitudinal conveyors *A*, *B* and *C*, on which they are subjected to comprehensive inspection, and if accepted they are passed to the right-hand ends of these lines, and thence to the transverse conveyor *G*.

As each body is passed by the inspectors, a tally card is made out and is passed by way of a Lamson tube system to the control room in the basement. Bodies which are not accepted are returned to the area *D*, whence they are subsequently despatched for rectification. Bodies are also introduced to the marshalling area by way of the conveyor *E*, which leads from the adjacent painting and trimming shop on the Canley site. As each body from this shop is completed, it is raised by a hoist and deposited on the conveyor *E*, which subsequently delivers it to the transverse conveyor *G*. It may be noted that the conveyor *E* can be run either continuously or intermittently, as required, selection being made in the basement control room. If the conveyor *E* is run continuously, the bodies on it are fairly widely spaced. In some instances, however, it is required to "stack" the bodies on this conveyor, for example, if the output from the painting and trimming shop is temporarily in excess of demand from the assembly floor. In these circumstances, the conveyor *E* is operated intermittently, being advanced through a distance approximately equal to the length of a body each time one is deposited. With this arrangement, the bodies are stacked nose to tail along the length of the conveyor, and a number can thus be stored temporarily.

It will be observed that the transverse conveyor

Fig. 1. General view of part of the top floor of the new Standard-Triumph vehicle assembly hall at Canley, Coventry. This floor, which has an area of 115,200 sq. ft., serves for automatically-controlled marshalling of fully-painted and trimmed bodies in preparation for lowering to the assembly lines on the next floor

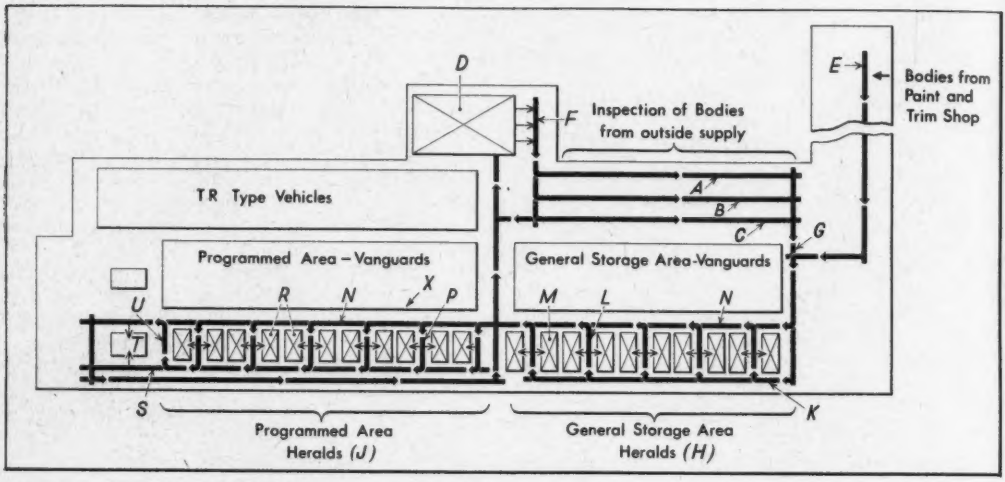


Fig. 2. Diagrammatic plan of the marshalling area on the top floor of the new building. Bodies for Heralds, Vanguards, and TR cars are grouped in this area, which has capacity for 500

G, to which bodies from both sources of supply are delivered, serves as a common feed to all areas on the floor. Subsequent marshalling procedure will be described in relation to bodies for the Herald car, but similar arrangements are provided for Vanguard and TR bodies in their respective areas. The area reserved for Herald bodies is divided into two sections—*H*, for general storage, and *J* for programmed storage. Bodies for the general storage area are delivered by the conveyor *G* to the conveyor *K*, whence each is subsequently moved along one of the small transverse conveyors (as at *L*). Selection of the required conveyor is effected remotely, from the basement control room, as is the final destination of the body when it leaves one of the storage beds. These beds, as shown at *M*, provide room for five bodies, side by side, and are filled, in the required order, from the associated transverse conveyors. Bodies proceeding along the conveyors are automatically shunted to the left or right, as indicated by the arrows, to fill the beds.

Bodies destined for the programmed area, indicated at *J*, are automatically transferred from the conveyor *G* to the longitudinal conveyor *N*, on which they are carried past the storage area *H*. Once they are in the area *J*, they are diverted by the transverse conveyors, as at *P*, into beds of similar layout to those in the area *H*. It should be explained that body shells for the various types of Herald cars are delivered to the top floor at random, but are marshalled into the various beds according to the requirements of the control room, account being taken of the availability of components in the basement stores, for example. A programme comprises one bed, which accommodates eight bodies arranged in two adjacent blocks of four—as indicated at *R*—and the bodies are fed into each bed in a predetermined sequence. This sequence, and the subsequent transfer of the bodies to the required locations, are determined and directed from the control room, and will be described later in a section devoted to that department.

The release of the bodies from the beds, and the order in which they are moved and transferred to the Mansaver hoist, are also regulated from the control room, as will be explained. Bodies are withdrawn from the programmed area by returning them from their beds to the transverse conveyors *P*. The latter then move them to the longitudinal conveyor *S*, on which they are transported to the left, to the hoist area. The hole in the floor of the marshalling area through which the Herald bodies are lowered to the assembly line is indicated at *T* in Fig. 2. Bodies are automatically delivered first to one side and then to the other of this opening, alternate bodies being diverted by way of the transverse conveyor *U*, and are picked up from either the conveyor *N* or *S* by the Mansaver hoist. Four men are stationed around the hoist area, and their duties include removing the skids from each body, just before it is lowered to the assembly line, and fixing an indentification number to the windscreen. Apart from the inspectors for the lines *A*, *B* and *C*, and a very small electrical and mechanical

maintenance staff, there are no other workers on the top floor of the building.

The view of the programmed area for Herald bodies given in Fig. 1 is from the position, and in the direction, of the arrow *X*, Fig. 2, and part of a transverse conveyor can be seen in the foreground. Suitably placed in the roof of the marshalling area are 13 Marconi television cameras, which are connected by closed circuit with six 14-in. screens in the control room. Five of these screens are permanently connected to five of the cameras, and the sixth screen can be connected to any one of the eight remaining cameras, at will. With this arrangement, the control room staff can monitor large areas of the marshalling system, and can check that the bodies are being stored as directed.

THE BASEMENT CONTROL ROOM

A view of part of the basement control room, showing the master push-button panel, is given in Fig. 3. This panel, which was supplied by Lee Beesely & Co., Ltd., Coventry, represents, in effect, two block plan diagrams of the marshalling area, with a separating portion between. The right-hand section, indicated at *A*, is used to control the filling of the various storage beds, and the left-hand section, at *B*, to control the release of bodies to the assembly lines. Immediately above the panel can be seen the six television screens, and it is the screen at the extreme left that can be connected to any one of eight cameras in the marshalling area.

On the control panels, each bed is represented by a group of rectangular push-buttons, and these buttons are of the type that incorporates a small lamp. The longitudinal and transverse conveyors are represented on the control panel by rows of yellow plastics rectangles, and as a body is moving along a conveyor its progress is shown by small lamps behind these rectangles, which are illuminated successively. Each of the push-buttons which represent the storage beds incorporates two lamps, and one half of the button is coloured green and the other half red. When an incoming body is seen to have entered the marshalling area, the button which represents its final destination in either the general storage area or the programmed area is pressed, and as a result the green half is illuminated. All eight buttons in a storage bed can be pressed, and the order in which they have been pressed is memorized by the control system.

Subsequently, another button associated with the bed is pressed, which results in that particular area being "activated." Bodies will then start to move towards their destinations, and as each one reaches its location, the red half of the associated button is illuminated. It will be recalled that as each body is released to the marshalling area by the inspection department, or the trimming and painting shop, a tally card is sent by Lamson tube to the control room. This card bears all the information relative to the body which is necessary to enable the car to be brought to the completed condition, to suit the specific requirements of the order. It shows, for example, details of the type of engine, type of tyres, whether a heater is required, colour and type of seat trim, etc.

From the receipt of the tally card in the control room, the staff of the latter have a maximum of 30

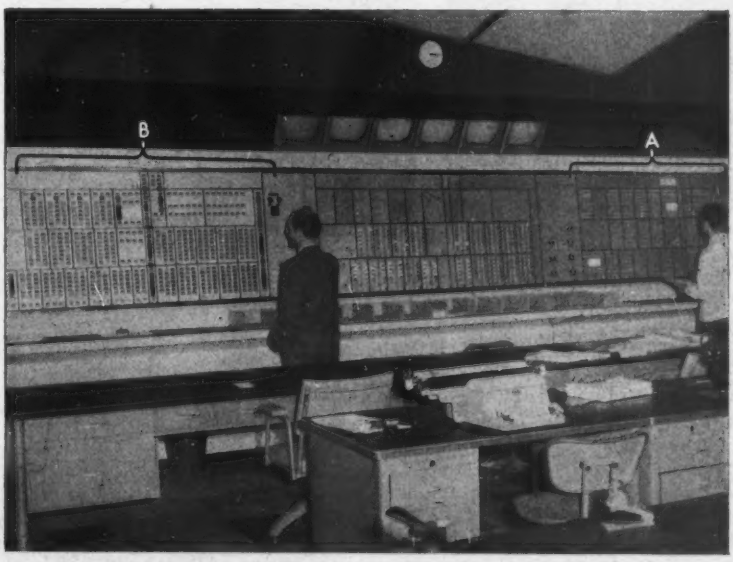


Fig. 3. The master panel in the basement of the building, whereby the movements of body shells in the marshalling area on the top floor are controlled and can be observed by closed-circuit television

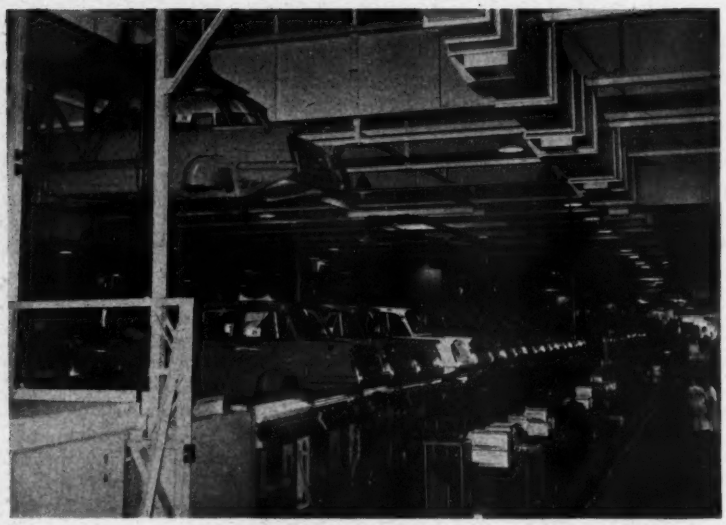


Fig. 4. A view of the start of the assembly line for Triumph Herald cars. The body shell at the left is in course of being lowered to the assembly line from the marshalling area on the floor above

min. in which to inform all the necessary departments, also the assembly line, of the requirements for a particular body, and to ensure that all the components needed are raised from the stores and brought to the required points along the assembly line. In other words, the time which elapses after a body shell has entered the marshalling area and before it is lowered on to the assembly line is of the order of 30 min., but may frequently be less.

As mentioned earlier, the left-hand side of the control board in Fig. 3 is virtually a duplicate of the right-hand side, and serves for releasing the bodies from the storage and programmed areas. Similar yellow plastics rectangles and red and green plastics push-buttons are employed, and the latter are illuminated in synchronism with the corresponding buttons on the right-hand side, as each body reaches its destination. To release a body from the storage or programmed areas, the button on the left-hand side of the board which corresponds to the particular location is pressed. The body then automatically leaves its stored position and proceeds to the Mansaver hoist.

As mentioned above, an identification number is fixed to the windscreen just before it is lowered to the assembly line, and by the time it reaches the latter the various components parts are *en route*, or have arrived, at the required points along the line. A programme comprises eight bodies, in a specified sequence, and the assembly line is warned in advance of the advent of a "programme" and of the types of car involved. The programming system has been found to have many advantages, notably as regards controlling and balancing the flow along the line of the various

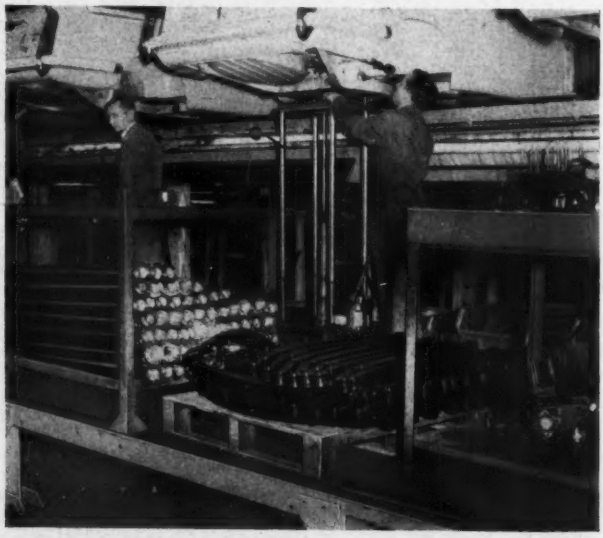


Fig. 5. One of the first items to be fitted is the differential unit, which is raised into position beneath the chassis by means of this small hydraulically-operated platform

Fig. 6. Complete engines are delivered to the line by overhead hoists, which are arranged to travel around an endless runway. The engine at *D* will not move into position until the hoist holding the engine at *E* has been cleared

types of car. An important factor in connection with programming is information regarding stock levels in the basement stores. For example, the control room may receive a report that component parts for de luxe versions of the Herald are temporarily reduced, and that they are outnumbered in a ratio of 2 to 1 by parts for basic versions of the car.

The control room can then make up programmes in which the ratio of basic bodies to de luxe bodies averages 2:1, and if the supply of de luxe bodies becomes excessive they can be diverted to the general storage area. Later a report may be received from the stores that components for de luxe cars have been restored to the required level, and the control room will then release the necessary bodies from the general storage area either direct to the assembly line, or by way of the programmed area.

As each body is released by the control room to the assembly line, details of the components required for its completion are sent to a LEO computer, which is installed elsewhere on the premises. This operation is part of the duties of a Flexowriter team housed in a special section immediately adjacent to the control room. The arrangement is such that the LEO computer is fed constantly with information regarding the running down and building up of stocks in the stores, also detailed information concerning the numbers and types of cars which are in progress on the line, and have been completed. With this arrangement, a comprehensive analysis can be obtained daily—and at shorter intervals if required—of all aspects of the installation.

THE ASSEMBLY LINE

A general view of the assembly line for Herald cars, from the starting end, is given in Fig. 4, where a painted and trimmed body is seen in process of being lowered from the top floor. It may here be noted that all the conveyors and auxiliary mechanical handling equipment on the assembly floor was supplied and installed by Geo. W. King & Co., Ltd., Stevenage.

Various items of interest along the assembly line will now be described, and attention is drawn first to Fig. 5, which is a view from the right-hand side of the line, looking slightly backwards towards the King Mansaver hoist. One of the first operations is the fitting of the differential unit, and this task is facilitated by the use of the wheeled platform *C*. This unit has a rectangular table-top portion, on which the differential unit is placed by hand, and the table can then be raised hydraulically to bring the differential to the required height. The unit is raised by a hand-operated hydraulic pump, and is pulled along on its wheels by the movement of the conveyor, once the four studs projecting from the differential unit have been engaged with the chassis. A quick-release valve is provided for lowering the platform.

Engines are delivered to the line complete by means of three motorized hoists which move around an endless loop runway. This runway is at the left-hand side of the line, as viewed from the starting end, and is partly seen in Fig. 6. An engine on its way to the line is indicated at *D*, and another is in process of being installed at *E*. The engine at *D* will come to rest at the end of the loop, and will not proceed until the hoist holding the engine at *E* has been moved away. As the latter hoist continues its journey it trips a switch

Fig. 7. At about one third of the distance along the line from the starting point, the bodies are lifted and turned through 90 deg. by this King Skywracker fork-lift type unit

which "calls in" the hoist holding the engine *E*, and the latter is thus brought to the assembly position.

Approximately one third of the distance along the assembly line, from the starting end, it is required to turn each body through 90 deg., so that it lies in line with the conveyor, instead of transversely across it. This operation is carried out by means of the King Skywracker fork-lift type hoist seen in Fig. 7, which is a view from the right-hand side of the assembly line, looking towards the starting point. A number of bodies can be seen in the background, in the transverse position, and that at the centre has already been lifted, and turned through 90 deg., and is in process of being carried down the line to the next section. The movements of the Skywracker hoist are controlled by limit switches which are actuated by the movement of the main conveyor, and are interlocked with the latter. It may be noted that the Skywracker also provides for transverse movement, in addition to the lifting and swivelling motions, so that the body can be brought back into line with the main conveyor after it has been turned.

The body is subsequently lowered on to the air-operated platform *F*, whereby it is deposited on the main conveyor once more. One of the later operations on the line is the fitting of wheels, complete with inflated tyres. At either side of the line, at this station, there is a continuously moving overhead conveyor, which lifts wheels from the basement stores and delivers them to a short roller-type conveyor. A view of this section, from the right-hand side of the line (looking towards the starting end) is given in Fig. 8. The overhead conveyor is seen at *G*, and it incorporates a number of simple, bent-tube, fork-type carriers, as at *H*. There is one wheel on each carrier, and

Fig. 8. Wheels, complete with inflated tube-less tyres, are lifted from the basement by a continuously-moving hanger-type conveyor and delivered to the assembly line as here shown

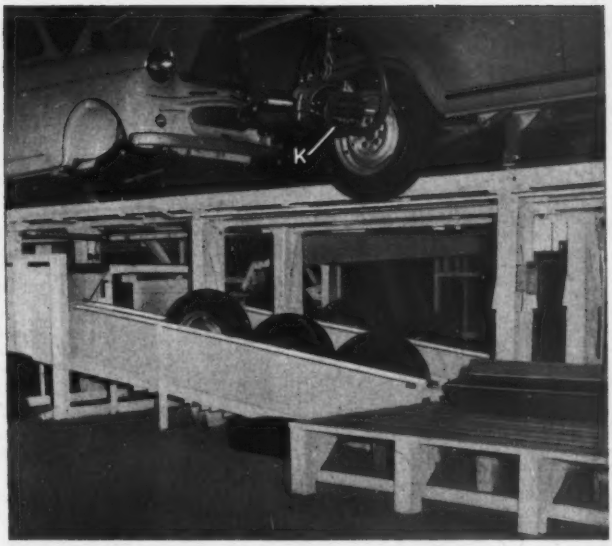


Fig. 9. From the hanger-type conveyor which is seen in Fig. 8, the wheels are diverted to troughs at each side of the line, whence they are lifted by hand and assembled to the cars

as the latter descends its forks pass between the rollers on the transverse conveyor *J*, and deposit the wheel, which slides down on its side. At the end of the conveyor *J*, the wheel is automatically turned through 90 deg., so that it is in a "rolling" position, and is diverted into a trough at the side of the main conveyor.

A view of one of these troughs, on the adjacent assembly line for Vanguards and small vans, is shown in Fig. 9. Each wheel is lifted from the trough by an operator, and placed in position on the wheel studs, and the nuts are driven home and tightened by a 4-spindle nut-runner seen at *K*. The latter is air-operated and is cable-suspended from an overhead point.

Final stages on the line provide for delivery of water, oil, and petrol to the cars, which are driven straight into booths for extensive running tests. From these booths, the cars are driven to a storm-water test cubicle, and thence to the final inspection and rectification lines.

The three assembly lines on the centre floor of the building are controlled from the comparatively small panel seen in Fig. 10, which incorporates block diagrams. This panel is housed in a special department, which extends for some distance down one side of the assembly floor, and includes all the switchgear associated with the conveyors and auxiliary equipment. Some of this switchgear can be seen at the left in the figure. On the panel diagram, the Herald line is at the bottom, the Vanguard line at the centre, and the TR line at the top. Pilot lights of six different colours are provided on the panel, and signify: emergency stop; shear pin failure; drive motor isolator or selector switch open; sequence failure;

Fig. 10. This panel serves to control the Vanguard, Herald, and TR assembly lines on the centre floor of the new building. Pilot lights of different colours indicate various conditions and defects of the conveyors and associated equipment

Fig. 11. Special machine employed for automatically assembling tube-less tyres to wheels, and inflating them

conveyor running; and electrical overload tripped.

Each of the pilot lights associated with a contingency is connected in series with an electric bell, and with this arrangement the panel need not be continuously manned. When such a light is illuminated, the bell rings and a member of the maintenance staff goes immediately to the panel to locate the type and location of the failure. Referring to the bottom diagram on the panel (for the Herald line) the endless loop at the left, and above the conveyor, represents the runway for delivering engines, and the rectangle about one-third of the way along indicates the turn-round station shown in Fig. 7. The smaller endless loop at *L* represents the wheel delivery section, and the three lines, as at *M*, the final inspection and rectification sections.

At the foot of the panel can be seen three dial-type tachometers, which register the speeds, in r.p.m., of the input shafts for the three assembly conveyors. These shafts are connected by way of electro-magnetic couplings to constant-speed driving motors, and the input speeds can be varied by controlling the fields of the couplings, by the knobs seen adjacent to the tachometers.

THE BASEMENT STORES

The basement, as already mentioned, is devoted to parts storage. It has a floor area of 140,000 sq. ft., and is provided with a total of 12 lifts. Ten of these lifts are rated at 2 tons, and two at 4 tons, and they serve to raise groups of parts to the centre floor, to suitable positions alongside the assembly lines. Component parts are stored in large stillages, and are moved about the storage area, also loaded into the lifts, with the aid of fork-lift trucks.

Special machines are installed in the stores area for automatically fitting tyres to wheels, and subsequently inflating them, and one of these machines is shown in Fig. 11. It has an intermittently indexing conveyor, arranged longitudinally, on which the wheels are placed, each with a tyre in partial engagement, as seen in the foreground. Each assembly is first indexed beneath a bridge-type structure which carries a pair of vertically-mounted rams. At its lower end, each ram has a castor, and as the wheel and tyre are brought into position the rams are thrust downwards, hydraulically, and the castors press and roll the tyre on to the wheel.

At the next working position, a large-diameter ram descends to flatten the tyre partially, the upper side being thus forced away from the rim. The ram seals against the tyre wall, and high pressure air is then admitted by way of openings in the under-side of the ram, positioned between its periphery and that of the wheel rim. With this arrangement, air is admitted all around the tyre, which is inflated very rapidly. As the tyre fills, it expands, and at the same time the ram is raised under the control of a pressure switch in the circuit.

Ultimately, a condition is reached at which the pressure within the tyre is great enough to snap it against the rim of the wheel, and this sudden upward movement serves to reverse the direction of the air pressure on the ram, which is consequently raised rapidly through a short distance.

Subsequently, the inflated tyre and wheel are indexed out of the machine on to a roller conveyor, whence they are picked up by the carriers of the conveyor described in connection with Fig. 8, and are raised to the centre floor at the required position alongside the assembly line.

Some Unusual Operations on Parts for Nuclear-powered Submarines

FOR THE PAST NINE YEARS, the building of nuclear submarines has been the major activity of the Electric Boat Division of General Dynamics Corporation, Groton, Conn., U.S.A. This work involves the machining of a great variety of parts in very small numbers. Many of these parts have contoured forms, and for this reason the equipment in the shop includes numerous tracer-controlled machine tools. Certain of the contoured parts must be machined to close limits of accuracy. Such parts include spherical-shaped members for ball valves which are made from copper-nickel alloy in sizes ranging from ⅝ to 18 in. diameter. They are turned on tracer-controlled lathes to an accuracy of ±0·001 in. and then polished to a finish of 8 micro-inches.

Another typical tracer-controlled operation, shown in Fig. 1, is the contour planing of a submarine antenna-mast fairing. This work is carried out on a Rockford hydraulic shaper-planer equipped with a Kopy-Kat duplicator attachment. The component is contoured on the cross section only and not on the length, and three templates are employed—one for the leading edge, one for the trailing edge, and one for the two side surfaces. This latter template is reversed when the work is turned over in preparation for machining the other side face.

The long workpiece is of aluminium and comprises three extrusions which are welded together. For this operation, the cutting speed is kept fairly low (about 150 ft. per min), because the tool must be stopped before it makes contact with a flange at the end of the cut. An undercut is provided in front of the flange to prevent damage to the high-speed-steel tool. On other antenna masts, without a flange, cutting speeds in excess of 200 ft. per min. are employed. Planing is completed in seven separate set-ups, and the shape is held to within a few thousandths of an inch. Since a plastics coating material is applied to a portion of the mast, this area is undercut by using a tool with a point which has a slightly larger radius than the tracer stylus.

Several sizes of antenna-mast fairings are planed with the same set of templates, compensation for the small dimensional differences being made by the use of various cutter-to-stylus radius ratios. The machine has a rated capacity of 42 by 42 in. by 26 ft. long and has one side head and two rail heads, one of which is tracer-controlled. The tracer control is provided with a safety device such that, in the event of power failure in the separate tracer hydraulic system, the tool-head is retracted to the uppermost position, to avoid damage to the work. In Fig. 1, the contour machining of one of the two side fairing surfaces is seen in progress.

Another contouring operation provides for cutting a circular gasket groove in a roller box for a torpedo tube. The workpiece is a curved member

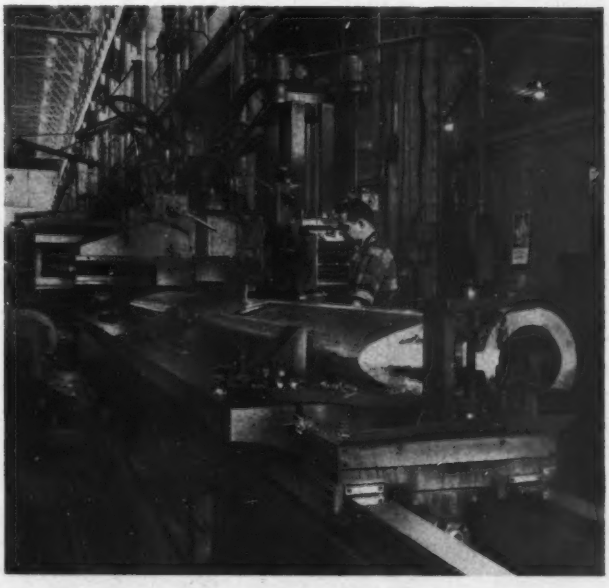


Fig. 1. Set-up for contour planing a submarine antenna-mast fairing on a Rockford hydraulic sapher-planer with a Kopy-Kat duplicator attachment. Seven separate set-ups are required to complete the part

Fig. 2. This numerically controlled drilling machine is here being employed to centre-drill, drill, and spot-face ten holes in a bronze gear case. Depth settings are made on the drum at the left of the drill head

of large radius which fits externally on a torpedo tube. The groove, which is curved on two axes, is cut on a horizontal boring mill that has been modified for the purpose. The boring bar is equipped with a follower and is loaded by a weight in one direction to cause the follower to rotate in contact with a fixed cam of the same shape as the workpiece. For machining the groove, the cutter is set to rotate in a circular path of the required radius, and the cam moves the bar and cutter in and out to follow the curved shape of the part.

Many operations on a variety of workpieces are carried out on the Hillyer tape-controlled drilling machine, shown in Fig. 2. A feature of the equipment is that an operator can punch his own tape with a direct-reading decimal code in accordance wth the plan dimensions of the workpiece. For this purpose, a special punching device is provided as seen on the left of the control panel in Fig. 3. The tape reader, located above the control panel, is here being inspected by the operator. A 4-in. wide plastics tape is employed. In operation, the table moves forwards and backwards and the drilling head from side to side in response to the digital information punched into the tape. The operator merely inserts the tool and pushes the start button for each cycle. Accuracy of positioning is within 0·001 in. per foot. Quick-change tool-holders, which simplify cutter mounting, are held in a special tool rack, seen at the lower left in Fig. 3. If the wrong tool-holder is removed from the rack, the machine will not go through the next machining cycle when the re-start button is pressed.

The component shown set up in the machine is a bronze gear case. Ten holes in this gear case, on a 14½ in. pitch circle, were centre-drilled, then drilled through $\frac{3}{32}$ in. diameter, and spot-faced $\frac{5}{8}$ in. diameter—all under tape control. Cycle speed depends on the operation to be performed. Centre drilling, for example, required 2 min. Depth of cut is set manually on the depth-control drum seen to the left of the drill-head in Fig. 2. This equipment has eliminated the need for much lay-

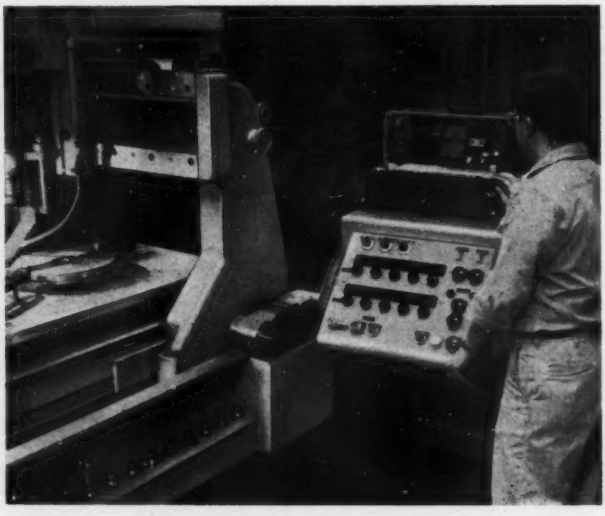


Fig. 3. Plastics tape, punched in a direct-reading decimal code, is here being inspected in the tape reader by the operator in preparation for machining the gear case illustrated in Fig. 2

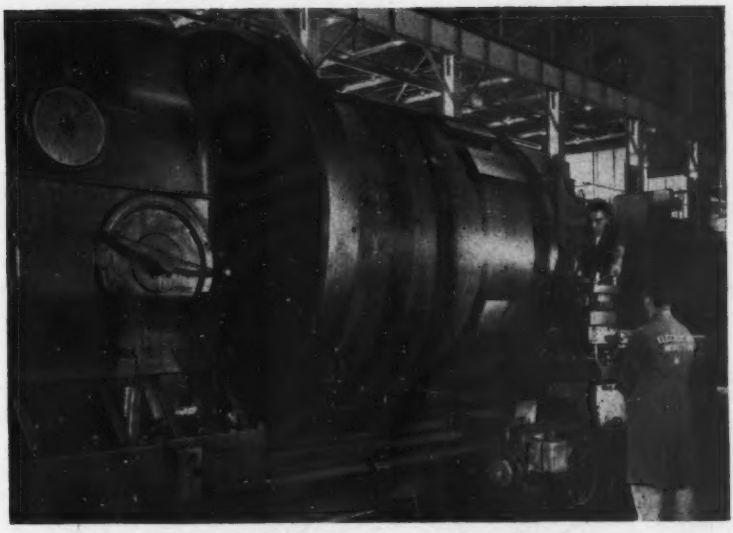


Fig. 4. This engine lathe, rebuilt to provide a 100-in. swing capacity, is employed to machine a square 5-start thread on the upper end of a Polaris missile tube

out work and many jigs. Location of the part on the work-table is simplified by a datum setting adjustment that enables the zero point of both axes to be relocated in any position on or off the work-table.

Many machines in the shop have been rebuilt to accommodate parts larger than those for which they were originally designed. In this connection, attention is drawn to the set-up shown in Fig. 4, for cutting a thread on a Polaris missile tube. The 30-ft. long engine lathe employed for this operation has been built up to increase the swing from 60 to 100 in. A five-start, 1-in. pitch, square thread is cut in the nickel-copper alloy flange at the upper end of the missile tube. The threads are cut simultaneously with five ganged tools at lathe spindle speeds which range from 2 to 4 r.p.m. Three sets of tools are used to complete the operation, the first set consisting of solid, $\frac{3}{16}$-in. wide bits for roughing. The $\frac{1}{4}$-in. wide tools in the second set, and the finishing tools, are relieved at the centres of the front edges. A 63-micro-inch finish is specified, and the outer corners of the threads are rounded slightly during the final cuts.

In one instance, a 23-in. diameter, nickel-copper alloy cylinder, 8 ft. long, was honed on a modified BarnesdriL horizontal machine originally built for bores up to 6 in. diameter. The bore diameters that can now be finished range from 1¾ to 16 in. and from 17 to 23 in. Lengths up to 21 ft. can be handled. For honing the 23-in. cylinder, abrasive grits ranging from 120 size for roughing to 320 for polishing were employed and a 16-micro-inch finish was obtained. Rotational speed (about 20 r.p.m.) and reciprocating speed of the hone were varied to maintain

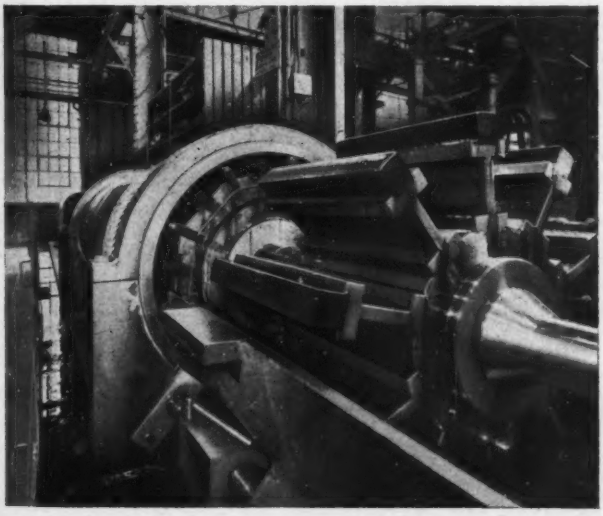


Fig. 5. Special honing tool employed on a modified machine to finish the 23-in. diameter bore of a nickel-copper alloy cylinder. A 16-micro-inch surface was obtained

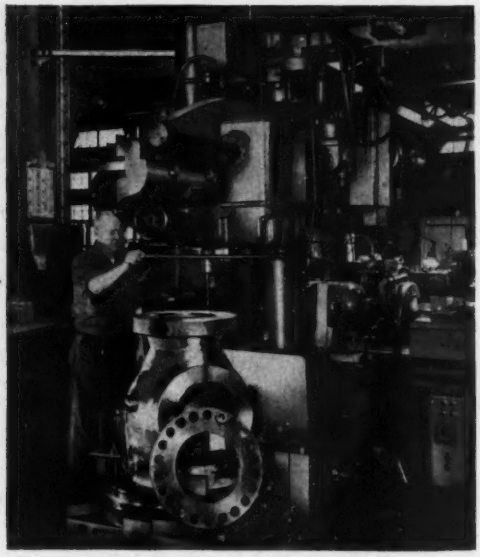


Fig. 6. For drilling bolt holes without the use of jigs, this copper-nickel valve body is mounted on a Lapointe Rotomatic table, which provides for automatic indexing. Jigs of the type seen leaning against the valve body were formerly employed

a favourable cross-hatch pattern. A slower reciprocating speed is used for polishing than for roughing. Fig. 5 gives a close-up view of the hone. For lubrication, a medium to heavy, sulphurized oil was employed.

The drilling of bolt holes in flanges for valves and other components is an everyday operation in many shops. At the works of the Electric Boat Division, however, owing to the variety of part sizes and forms and the small numbers required, the provision of jigs and fixtures for such operations presents a problem. To alleviate this situation and enable work quality to be improved, Lapointe Rotomatic indexing equipment is used in conjunction with a Carlton radial drill for accurately machining bolt holes without jigs.

In Fig. 6, a copper-nickel valve body is seen set up for drilling on this equipment, the 22 bolt holes, of 1⅛ in. diameter, being located on a 19½-in. pitch circle. The rotary table is of 36 in. diameter and can be automatically positioned, it is stated, to within 5 sec. of arc under push-button control. (An error of 5 sec. of arc on 19½ in. diameter represents approximately 0·00024 in.). Any number of divisions from 2 to 120 can be obtained automatically, and other numbers under manual control. The jig seen leaning against the workpiece in the illustration is of the type formerly employed for such operations. Parts weighing up to 5 tons can be indexed automatically on the table without loss of accuracy.

A job which was completed at short notice for the Atomic Energy Commission involved machining a considerable number of plates, 35 ft. long, 35 in. wide, and 1⅛ in. thick, of commercially pure nickel. The minimum thickness of the finished plates was ⅞ in. and they were required to be accurately flat. After various experiments, it was found that the most effective method was face milling, with a high-speed-steel cutter. The plates were machined on an Ingersoll plano-mill as seen in Fig. 7. In addition, a large number of blind holes had to be drilled and tapped. It was found that the nickel could be tapped efficiently with gun type taps, using Lasupar (a product of the Gulf Oil Co.) as a lubricant.

One of the many larger jobs handled in the shop is seen in Fig. 8. This structure is the framework for a universal submarine simulator which is employed for training members of submarine crews. In the illustration, a bearing surface at the top of the frame has just been finished on a large Sellers boring and milling machine of the travelling-column type.

Quick-change tool-holders are favoured for use

Fig. 7. One of a number of 35-ft. long plates of commercially pure nickel which were machined flat on an Ingersoll plano-mill

on horizontal borers, radial drills, and some milling machines. With such a holder, a tool can be mounted in exactly the same position each time, and a special turret stop has been developed for mounting on the bar of a horizontal boring mill to permit rapid repositioning for repeat operations.

Inserted-tooth milling cutters are also used extensively. For example, 8-tooth Futurmil cutters, with 6-in. diameter bodies and heavy-duty Grade 370 Carboloy indexable inserts, with negative rake, are being employed to machine nickel-copper alloy at a feed of 30 in. per min. and bronze at 50 in. per min.

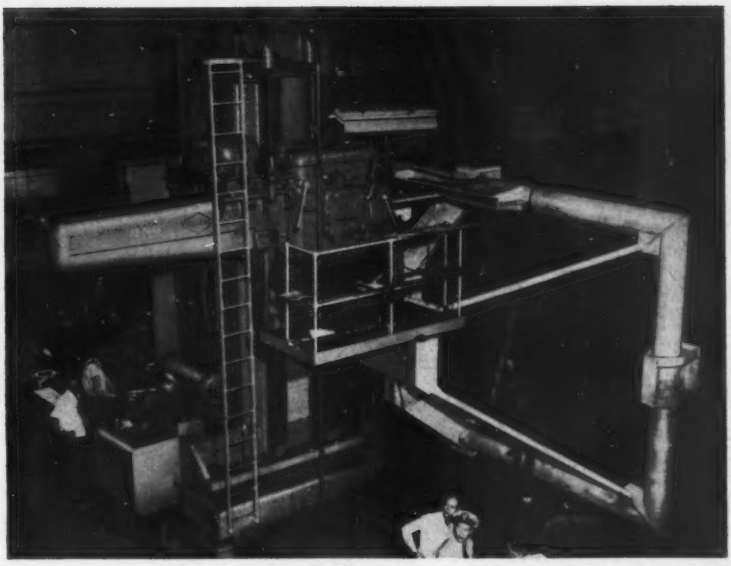


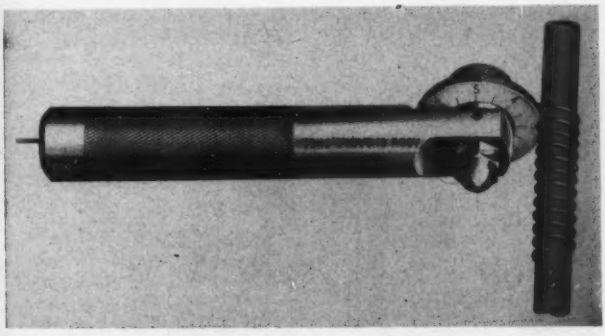
Fig. 8. The milling of bearing surfaces on this framework for a submarine simulator is typical of many operations performed on large workpieces

Every part is subjected to 100 per cent final inspection, and first-piece inspection is performed for every operation.

For work of the type undertaken in this shop, which commonly requires longer to set up than to machine, operator skill and experience are all-important. To maintain a supply of skilled men of the necessary quality, there is a 4-year apprentice training programme.

Acru Hand Spring Winding Tool

The hand spring winding tool, here illustrated, which is made by the Acru Electric Tool Mfg. Co., Ltd., Demmings Road, Councillor Lane, Cheadle, Cheshire, now incorporates an improved type of plastics pressure disc. This hand tool is intended for making springs in small quantities which do not warrant the time or expense of setting up special machinery or equipment.



The Acru hand spring winding tool which now incorporates an improved plastics pressure disc

Wire is fed through the handle and passed between a steel disc and the plastics disc, which are then clamped together. The pressure applied is selected according to the diameter and hardness of the wire, and the spacing between the coils of the spring wound on the mandrel is determined by the setting of a tapered disc.

This tool will accept wire ranging up to a maximum of $\frac{3}{16}$ in. diameter, and springs can be wound to any desired inside diameter. The maximum pitch obtainable is $\frac{3}{16}$ in.

Oberg H.F. Electric Spindles

VARIABLE SPEEDS up to 70,000 r.p.m. and 90,000 r.p.m., in conjunction with power/weight ratios of 143 watts per lb. and 200 watts per lb., are obtainable, respectively, with the Oberg type 10 and 17 portable high-frequency electric spindles shown in Fig. 1, which weigh 12 oz. and 32 oz. These units, which are intended for use with carbide burrs, grinding wheels, milling cutters, and other small tools, may be hand-held, or set-up on machine tools for operations such as drilling, copy milling, engraving, and internal grinding. The spindles, and the frequency-converters required to supply them, are produced by Oberg Machine Co. AB., Eskilstuna, Sweden, who are associated with C. O. Oberg & Co:s AB., specialist manufacturers of files and burrs. The agent for the Oberg Machine Co., A.B., in this country is H. Williams & Son, Ltd., Sandridge Road, St. Albans, Herts.

Six designs of frequency changers are available, designated types 78, and 93 to 97 inclusive, which are of various output ratings from 200 W. to 3,000 W. With the type 78 converter, the output frequency is variable, thus affording a range of spindle speeds from 35,000 to 70,000 r.p.m., whereas each of the remaining units in the series provides two speeds. For example, with the type 95 unit, speeds of 27,000 and 54,000 r.p.m. are obtainable, and the overall range covered by the 2-speed units is 13,000 to 90,000 r.p.m. The number of spindles that can be driven by each converter varies according to the output capacity, and the duties for which the spindles are required, and ranges from two to ten for the type 10, or two to six for the type 17.

Fig. 1. The Oberg type 10 and type 17 portable H.F. electric spindles, here shown, provide speeds up to 70,000 r.p.m. and 60,000 r.p.m., respectively

The spindles are notably compact. Each is enclosed in an anodized duralumin housing, and for the type 10 spindle, which has an overall length of 5·3 in., excluding the chuck, the overall diameter is 1·3 in. For the type 17, the corresponding dimensions are 7 in. and 1·77 in. This compactness, and the high power/weight

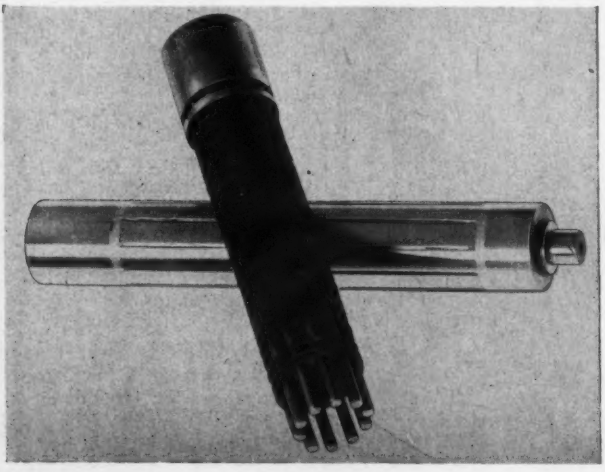


Fig. 2. In the Oberg patented " shaftless " rotor, the laminations are held together by the bars of the squirrel-cage assembly

ratio, are achieved by the use of a patented "shaftless" type of rotor, of the design shown in Fig. 2. The rotor laminations are held together, between the end rings of the squirrel-cage, by the beryllium copper conductor bars, and the journals and shaft extensions are provided by brazed-on solid end portions. The assembly thus forms an effectively integral, combined rotor and shaft.

At each end of the rotor stack, the conductor bars project into a groove between the end lamination and a step on the face of the solid end portion. During assembly, the stack and end portions are clamped axially, under a hydraulic press, and each groove is filled with a suitable conducting metal, by an induction heating process, this metal serving both as a jointing medium, and as an end ring of the squirrel-cage. Cooling contraction effects, coupled with elastic recovery of the stack when the press load is removed, provide the necessary uniform tension in the conductor bars, to clamp the laminations securely, and to ensure adequate rigidity at high rotational speeds. Since, with this type of construction, the laminations are not interrupted by a shaft, electrical and mechanical efficiency are increased, and the diameter of the rotor can be correspondingly reduced.

Both sizes of spindle are of the 2-pole, 3-phase, type, to provide high torque and uniform speed under varying load, and since they are designed to operate at a maximum of 50 volts, risk of accident due to "flash-over" is avoided. Convenience in handling, afforded by the compact design, is enhanced by the fact that gyroscopic effects are minimized by the small diameter of the rotor, and the maximum temperature rise, under working load, is only of the order of 17 deg. C. The shafts run in precision ball bearings, which are lubricated by incorporated oil reservoirs, and under normal working conditions, only require attention after each 1,000 hours of operation. Replacement of the bearings is facilitated by a patented locking system that ensures concentricity of the rotor and stator.

A range of collets is available, in capacities of 2·3 mm. to 8 mm. (0·09 in. to 0·315 in.) which are of a double-slit design, to ensure firm grip and accurate alignment.

Owing to the slim cylindrical shape, the spindles are very suitable for set-ups on standard machine tools, and simple holders, adapters and attachments can readily be made for this purpose. In a number of instances—for example, on certain types of grinders—an Oberg H.F. spindle can be mounted directly in the spindle housing, in place of the normal spindle provided on the machine, as in Fig. 3. This illustration shows a type 17 spindle set up on a Jungner tool grinding machine fitted with a Husqvarna Coordiform attachment, for grinding a small bore in the end of a press tool punch. The Oberg spindle is held in the wheel-spindle housing with the aid of a split adapter sleeve A, and a similar set-up on the same machine is employed for profile grinding punches.

A range of attachments is available for setting-up the spindles on various machine tools, and includes both fixed and adjustable tool-post mounting designs. On one of the latter, which has a plain square shank, the holder is arranged to pivot, and is provided with a protractor scale and clamp, so that the spindle can be set and locked in any angular position in a plane at right angles to the

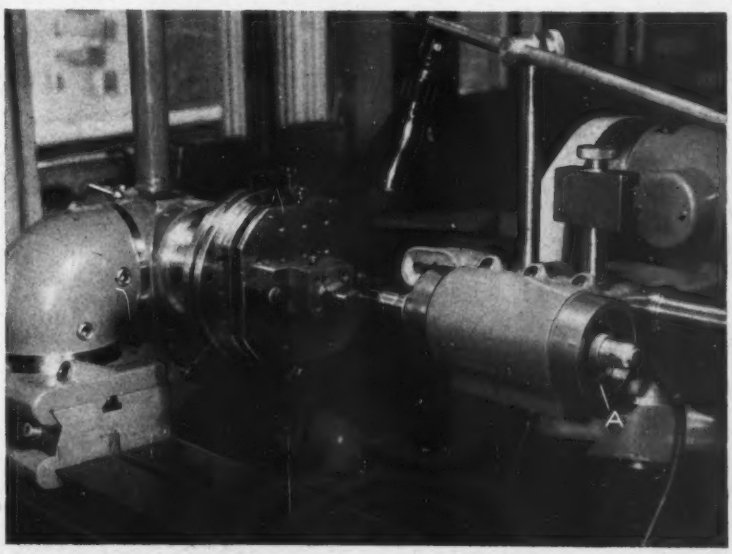


Fig. 3. Typical set-up, on a Jungner tool grinding machine, fitted with a Husqvarna Coordiform attachment, with an Oberg spindle mounted in the wheel-spindle housing

shank. With another arrangement, for mounting on multiple tool-posts, the holder is similarly inclinable, and, in addition, is adjustable for height, by means of a vertical screw. Other attachments available include a universal type, with two angular adjustments, designed for mounting on dovetail ways of various widths; a holder for mounting the spindle on a pantograph type engraving machine; and a linkage system and mounting, for copy profile grinding cams from oversize masters, at reductions up to 5:1.

Metalectric Unicarb Installation

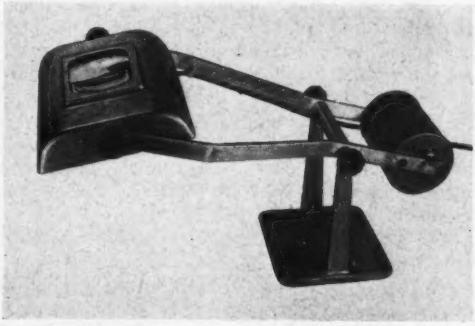
In the accompanying illustration is shown a Unicarb electric furnace installation which has been supplied to Ford Motor Co., Ltd., by Metalectric Furnaces, Ltd., Cornwall Road, Birmingham, for carburising and carbo-nitriding heat treatments. The Unicarb sealed quench furnace, seen on the left, is rated at 71 kW., and the chamber dimensions are 3 ft. 6in. long by 2 ft. 3 in. wide by 1 ft. 3 in. high. Charging, discharging and quenching arrangements are fully automatic and the plant was supplied complete with endothermic generator and equipment for the addition of propane and ammonia. The tempering furnace is at the right.

This latest Unicarb furnace incorporates open-type electric heating elements which have been introduced, after extensive research, for use in carburising atmospheres. The elements operate on low voltage and special treatment enables them to withstand the carburising action of the furnace atmosphere. They have been developed from a special strip element material, and it is stated that they are very simple to install. A high electrical rating can be obtained, and heating is exceptionally rapid. Consequently, particularly for short cycle carbo-nitriding, a large throughput is possible in relation to the furnace volume.

Metalectric Unicarb furnace installation at the works of Ford Motor Co., Ltd.

I.V.A. Illuminated Magnifier

In the accompanying illustration is shown the I.V.A. illuminated magnifier, which has been introduced recently by I.V.A. Engineering Co., Ltd., Fishermans Quay, Littlehampton, Sussex.



I.V.A. illuminated magnifier

A lens with a magnification of slightly more than 2× is provided, and the work is illuminated by means of two 9-in. fluorescent lamps, which have long life and can be operated from a.c. supplies at voltages between 220 and 250. With this arrangement, it is stated, no discomfort is suffered by the operator due to heat radiated from the light sources when viewing is being carried out for long periods. The lamp housing is mounted on a balanced arm.

Production of Newbould Segmental Saws

SANDERSON BROTHERS & NEWBOULD, LTD., Attercliffe Steel Works, Sheffield, 9, have been engaged in steel making for about 180 years, and for a long period their products have included saws for cutting metals cold. The segmental type circular saw, which has renewable tooth-bearing segments, is now very widely employed, and will operate at high rates of feed and speed.

Such a saw comprises a plate or body made from high tensile steel, heat treated and tensioned, and segments which are accurately machined, slotted, and riveted to the body. Each segment has from 3 to 20 teeth as standard, depending on the purpose for which the saw is required, and is so treated as to ensure maximum hardness of the teeth, the portion in which the rivet holes are drilled being left somewhat softer and therefore tougher. The teeth can be resharpened many times, and in the event of breakage, owing to accident or faulty operation, individual segments may be replaced provided that the body is undamaged.

A segmental saw has an action resembling that of a milling cutter, the material being removed in spirals. Roughing and finishing teeth are spaced alternately around the periphery, the former having bevelled corners and being slightly higher than the finishing teeth. One of the main factors governing the efficient operation of segmental saws is the sharpening of the teeth, which must be done on a suitable machine, to the forms and angles recommended by the makers for cutting various materials.

To meet the increasing demand for segmental saws, the department has been re-organized and re-equipped in recent years to provide for flow production. Material for both bodies and segments is supplied by the company's rolling mills. Body material, which is a nickel-chromium molybdenum steel, is received in the shearing section of the works in the form of annealed sheet. Here, each blank is cut approximately to the required diameter, and a hole of 1¼ in. nominal diameter is drilled in the centre, to serve for location at subsequent stages. Rough blanks are transferred to the heat-treatment department where they are hardened and tempered to 375-401 Brinell, large gas-fired furnaces being employed. For hardening, the blanks are heated to approximately 880-890 deg. C. and quenched in oil by the Goff method, which involves holding them between grid-type clamps to maintain flatness. The blanks are then placed in other Goff clamps prior to reheating to 590-600 deg. C., for tempering, risk of cracking being thus reduced.

After they have been heat treated, the blanks are transferred to a section where skilled smiths straighten and tension them by hand hammering, and they are then subjected to a rigid inspection, including checking on a precision spindle. At the next stage the body blanks are ground to thickness, and they are subsequently returned to the smiths' department for final checking.

The final operations on the bodies are carried out in the machining department and include turning the outside diameter and the location web whereby the segments are registered. This web is machined to an accuracy of 0·002 in. for thickness, and to 0·001 in. for equality of depth to the shoulders. For drilling the rivet holes in the rim a

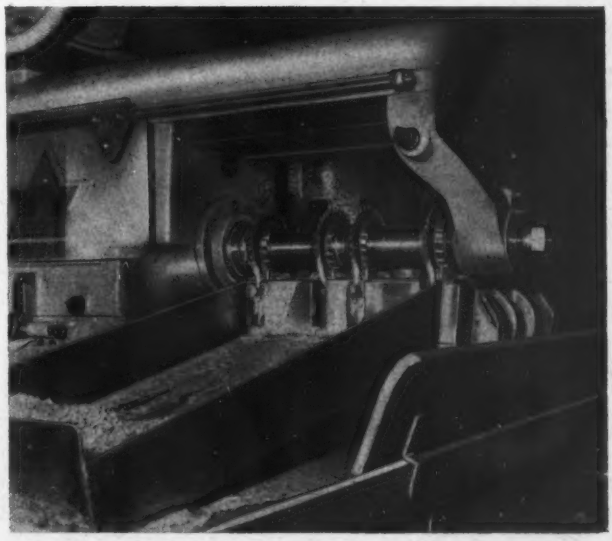


Fig. 1. Cutting the radii and slots on four saw segments at one setting on a Wyssbrod hydraulically-operated profile milling machine

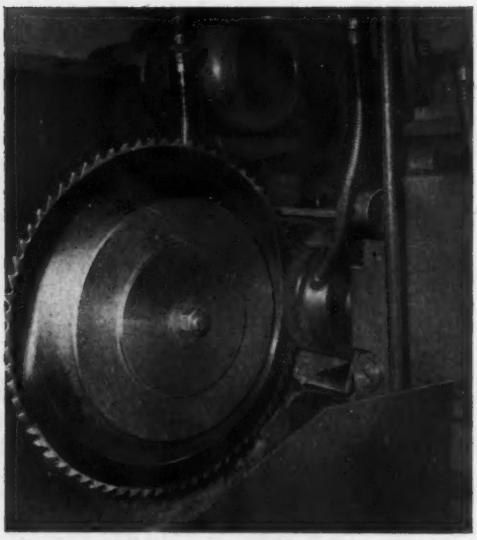


Fig. 2. Close-up view of the duplex-head face grinding machine designed and built by the company for taper grinding the saw segments

circular indexing jig is employed, which is adjustable to suit all sizes of bodies, the holes being so positioned as to provide from 0 to 0·010 in. draw when assembling the segments.

Production of the segments begins with sawing pieces of the required length from annealed high-speed steel bar, and these blanks are then surface ground on a Snow G.B.14 machine equipped with a resinoid-bonded segmental wheel. The ground blanks are then subjected to a magnetic crack detection test to ascertain whether there are any flaws in the material. After this test, the blanks are passed to a section where the fixing holes are drilled, on a Boley multi-spindle machine, and are subsequently reamed and countersunk on single spindle machines. Further inspection is undertaken, and the blanks are then transferred to the milling section where the ends are machined to the required angle and to the correct fitting length within a tolerance of 0·005 in.

Subsequent operations depend on whether fine or coarse-pitch segments are to be made from the blanks. The teeth of the fine-pitch segments are ground from the solid after hardening, and at this stage, therefore it is only necessary to machine the peripheries to the correct radius. Coarse-pitch segments, however, are mounted in gangs of ten in eight fixtures on the periphery of the work-table of a standard indexing-type gear milling machine on which the teeth are cut. Segments of both types are next transferred to a battery of Wyssbrod hydraulically-operated profile milling machines on which the centre slot and the base radius are produced. Four segments are gang milled on each machine at one setting, as seen in Fig. 1

After further inspection, segments are hardened and tempered to 60-62 Rockwell C at the tooth portion, and 49-51 Rockwell C at the rivet holes, to ensure sufficient hardness at the cutting edges and adequate toughness where the segments are secured to the body. At the next operation, both sides of the segments are finish ground and they are then subjected to further crack detection. The body and segment production lines converge at the riveting section where the segments are assembled to the bodies. Rivets of 40/45 ton steel are first placed in position by hand, and final riveting is performed on a pneumatically-operated press. A duplex-head grinding machine shown in Fig. 2, the design for which was prepared by the company, is subsequently employed for grinding the back taper on the segment portion of each saw, with 8-in. diameter resinoid bonded cup wheels. The saw is then transferred to the smiths' department for final hand blocking and tensioning of the body.

Finally, the teeth are form ground on a battery of Heller automatic machines, and a view in this section is given in Fig. 3. Coarse-pitch saws require finish grinding only, since, as has been

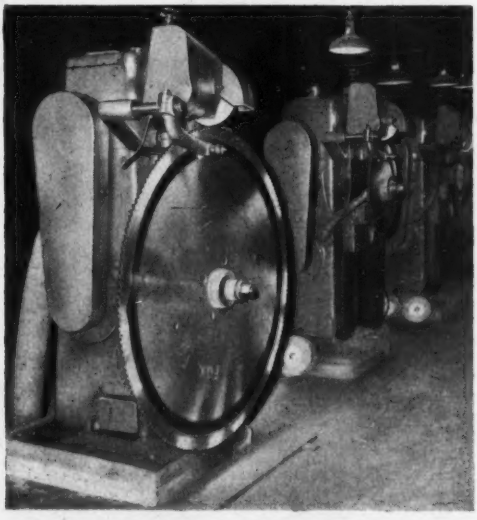


Fig. 3. A view of part of the installation of Heller tooth-form grinding machines

explained, the teeth have already been rough milled, whereas fine pitch teeth are form ground from the solid. Index plates are used on these Heller machines to ensure correctness of tooth pitch, and the wheel heads are designed to operate at two height settings to produce the alternate high and low teeth required for roughing and finishing, as previously described.

The final operation consists of grinding relief flutes down the sides of the teeth on coarse-pitch saws, to give increased clearance and to assist the flow of coolant when the saw is working. On completion of this grinding operation, the saws are thoroughly inspected once more and are then prepared for despatch.

Lewis No. 21-FHA Travel-Cut Shape Straightening and Cutting-off Machine

Recently introduced by the Lewis Machine Co., Cleveland, Ohio, U.S.A., the No. 21-FHA straightening and cutting-off machine, shown in the figure, has a capacity for handling square and hexagonal mild steel bars, in coil form, in sizes from $\frac{5}{16}$ to $1\frac{3}{8}$ in. across flats, also other shapes of equivalent cross-sectional areas, of width not exceeding 2 in.

Steel bar from a coil is fed through a 3-roll preliminary straightening unit at the left-hand end of the base, which "breaks" the bow in the metal, thence through a set of eight rolls mounted on vertical shafts, for edge straightening, and finally through another set of eight rolls carried on horizontal shafts for finish straightening. All roll shafts are mounted in roller bearings, and are driven by a 2-speed sliding gear unit which gives straightening speeds of 150 and 195 ft. per min.

The bearing housing for the roll shafts for edge straightening can be adjusted in the horizontal plane for accommodating bars of different widths within the range handled by the machine. Rolls for edge straightening and finish straightening can be adjusted independently to obtain the required working pressure and off-set.

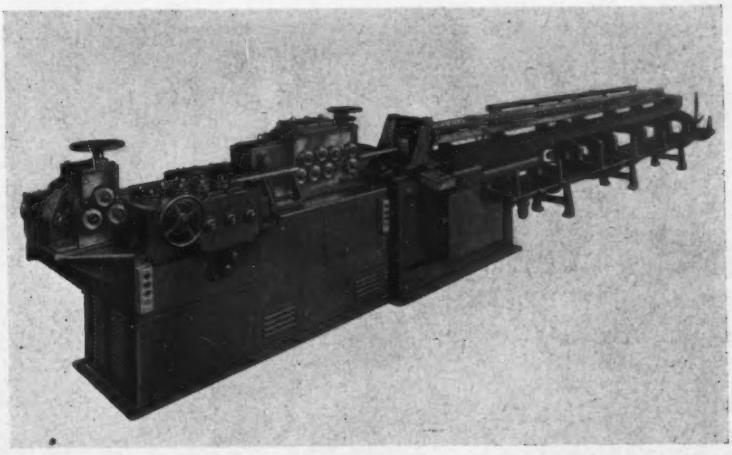
After it has been finish straightened, the bar is passed through a split guide piece, and operates a limit switch, which energizes solenoid valves to bring into operation a Travel-Cut high-speed flying shear of new design. The end of the bar also makes contact with a stop which is connected to the flying shear by release links, and serves only to control the length of the piece which it is required to cut off.

Longitudinal movement of the flying shear and the vertical cutting motion are derived from a crank disc through a single lever, and accurate control of the cutting-off operation is thus ensured. Drive to the crank disc is taken by way of a flywheel and an air-operated clutch and brake, controlled by the solenoid valves, from a Reeves variable-speed motor, which enables the longitudinal speed of the flying shear and the bar to be accurately synchronized.

With this arrangement, the possibility of marking of the bar is avoided. The air-operated clutch and brake ensure smooth starting and stopping of the flying shear, and the limit switch and the stop can be adjusted to suit the length of the piece to be cut.

The company's range covers more than 50 straightening and cutting-off machines, which have capacities for handling wire and bar stock from 0·012 to 1 in. diameter, also squares, hexagons and flats from $\frac{1}{16}$ to $1\frac{3}{8}$ in.

Gaston E. Marbaix, Ltd., Devonshire House, Vicarage Crescent, London, S.W.11, are the distributors in the United Kingdom for straightening and cutting-off machines from the ranges built by the Lewis Machine Co.



Lewis No. 21-FHA Travel-Cut shape straightening and cutting-off machine

New Factory Premises of The Spooner Dryer & Engineering Co., Ltd.

A factory extension of some 25,000 sq. ft. was recently opened by the Rt. Hon. F. J. Erroll, M.P., Minister of State, The Board of Trade, at the Moorland Engineering Works of The Spooner Dryer & Engineering Co., Ltd., Ilkley, Yorkshire. This company specializes in the production of drying and heat treatment equipment for many industrial purposes, but mainly for use in the paper, textile, and plastics manufacturing and processing industries.

Originally established in 1932, the business was converted into a public company in 1960, and is well established in the export field, approximately 50 per cent of the output being regularly consigned to various overseas markets including Germany, Japan, Australia, Norway, Sweden, Canada, the U.S.A., and South American countries, and the U.S.S.R. It may be noted that a recent contract was obtained from Finland for two paper drying units, of a total value of about £50,000.

The factory extension provides for a fitting and assembly bay, a tool-room, a fine-fitting department, a general machine shop, and a sheet metal and fabrication section. Some 210 ft. long by 40 ft. wide, the main assembly bay has glazed roofing for natural lighting, and artificial illumination is provided by fluorescent tubes which extend for the full length. Oil-fired central heating is provided throughout the new extension.

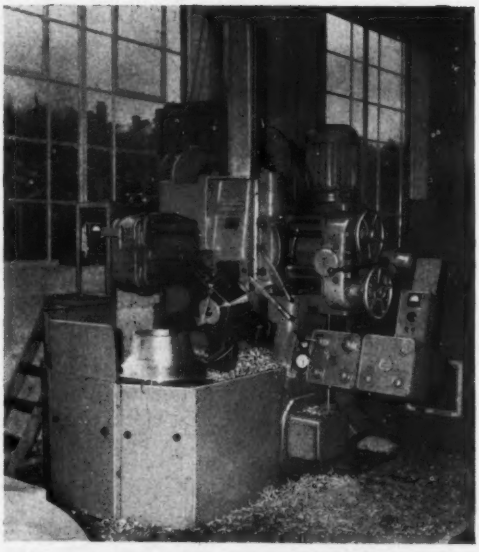


Fig. 2. Webster & Bennett vertical boring and turning mill equipped for electronic copying, and set up for machining axial flow fan casings

Modern machine tools are installed in the general machine shop, and each operator is supplied with a locker for personal equipment. Fig. 1 is a view in this department, the turret lathe section being on the right of the gangway, and the centre lathe

Fig. 1. A view in the general machine shop in the new extension

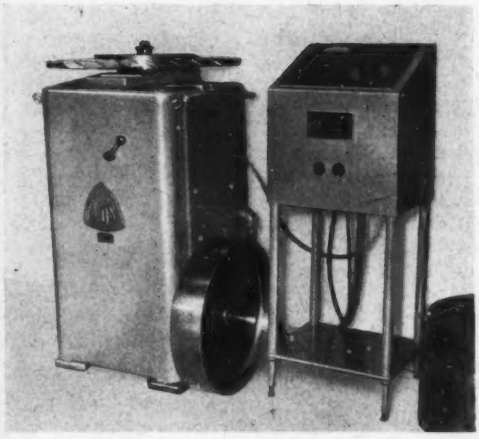


Fig. 3. Axial flow fan rotors are balanced on this LOS machine

and milling sections on the left. In Fig. 2 is shown a 36-in. Webster & Bennett vertical boring and turning mill with Lancashire Dynamo electronic copying equipment, set up for machining an axial flow fan casing of Hiduminium RR.50. It is stated that with this machine the time per component has been reduced from 2 hours, with the method previously employed, to 45 min. On the first floor, immediately above the machine shop, is the well-equipped tool-room and fine-fitting section where all special tools, jigs, fixtures, and dies required for production purposes, are made, and the axial flow fan units are assembled. Equipment in this section includes a LOS balancing machine built by Losenhausenwerk, Dusseldorfer Maschinenbau, A.G., which is used for balancing axial flow fan rotors, as shown in Fig. 3.

Extending parallel with the main assembly bay, the sheet metal and fabrication department covers an area of some 6,000 sq. ft. Equipment in this department includes a flanging machine, a lock forming machine, and a battery of power folders by Oliver; a Keetona plate rolling machine of 8-ft. by ⅛-in. capacity; an Edwards 40-ton capacity, inclinable, adjustable stroke power press; a British Clearing press brake with a capacity of 8 ft. by 90 tons; and a Rhodes 8-ft. by ¼-in. capacity guillotine shearing machine.

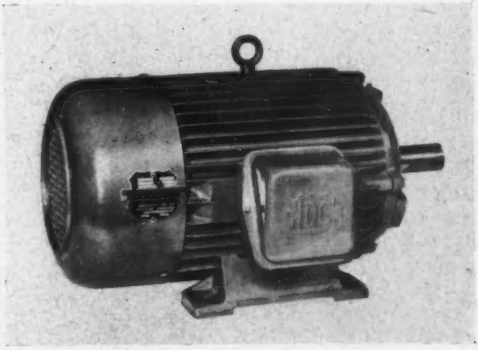
The extension will enable the company to increase output by approximately 50 per cent, thus enabling supplies to the home market to be maintained while export markets are expanded and consolidated.

Crypto-D Totally-enclosed Fan-cooled Motors

Totally-enclosed, fan-cooled, cage-rotor motors, in a range which has been introduced recently by Lancashire Dynamo & Crypto, Ltd., Acton Lane, London, N.W.10, conform dimensionally to B.S. 2960 Part II, but for each frame size, the motor can be built to provide a considerably higher output than is required by this specification. Consequently, machines can be supplied to comply with the latest requirements of the West German Standards Institution (Deutsches Industrie Normen), and the American N.E.M.A. standard can also be met. The motors are said to offer particular advantages for applications where small, light units, with low rotor inertia, are desirable.

Available with outputs from ½ to 50 h.p., and for foot or flange mounting, the motors have Class E insulation, and with the improved output, the performance is in accordance with B.S. 2613, with a temperature rise not exceeding 65 deg. C. (40 deg. C. ambient temperature) at continuous maximum rating.

Arrangements can be made for protection against weather, and corrosive and dust-laden atmospheres, and in each unit, the dynamically-balanced rotor runs in pre-loaded ball bearings of the medium metric type, which are packed with high-grade lithium-base grease. Lubrication is required only at long intervals, and nipples are provided. If required, oil seals can be incorporated, to enable motors to be directly coupled to gear units, for example. The stator winding is well-braced, and the transfer of heat is facilitated by an interference fit between the stator pack and the well-finned



Representative of the new Crypto-D range of totally-enclosed electric motors, this 10-h.p. unit has a frame size of 215

housing. A terminal box, with a cable inlet that can be adjusted through an angle of 90 deg., is normally arranged at the left-hand side, as may be seen in the accompanying illustration, which shows a 10-h.p. unit from the new range. This motor is provided with a size 215 frame.

Equipment Leasing Company, Ltd.

Hambros Bank, Ltd., Phœnix Assurance Co., Ltd., and Cable & Wireless (Holdings), Ltd., in collaboration with Lease Plan International Corporation, New York, U.S.A., have formed a company which is to specialize in the large-scale leasing of capital equipment and vehicles to British industrial firms and other commercial undertakings. The company, which is to start operations on October 2, is known as the Equipment Leasing Co., Ltd., 50 Leadenhall Street, London, E.C.3, and it will have substantial finances available from the initial subscribers and from many other sources. The authorized capital is £500,000 in £1 shares, some 25 per cent of which will be held by the American participant. In the U.S.A., this corporation has already had extensive experience of leasing and revenue has increased from 2 million dollars in 1950 to an estimated 26 million dollars this year.

At first, the British company will concentrate on financial leasing which involves no maintenance, insurance, or labour commitments. Subsequently, these facilities may be afforded. American experience shows that the most usual items for leasing are machine tools and other types of factory equipment.

A firm which decides to use the company's leasing facilities will first specify its requirements, and the company will then purchase the necessary plant, which will probably be of United Kingdom manufacture. The rent will be based on the cost of the equipment, together with management and interest charges, and on the leasing period, which will vary according to the needs of the user. At the end of the leasing period, the customer can continue to lease at a small prearranged rental. The plant will always remain the property of the Equipment Leasing Co., Ltd.

While maintenance and insurance of the new plant are the responsibility of the lessee, these are counted as charges against tax. Apart from the obvious advantage of leasing—that working capital remains available for other purposes—it is pointed out that tax relief is obtainable on the whole of the rentals, instead of on capital allowances only. Although the lessee cannot qualify for the investment allowance, the leasing company will be able to claim, and the benefit will be passed on to the customer. Other advantages claimed for leasing are that the execution of major contracts that require specialized machinery for limited periods is facilitated, and that industry can be periodically re-equipped with the latest types of machinery, obsolescence and heavy maintenance costs on old plant being thus avoided.

The rate of interest which is to be charged by the company has not yet been announced, but it is stated that both the initial payment and the interest rate will be lower than those charged under hire purchase arrangements.

Equipment Leasing Co., Ltd., expect to conclude agreements with European associates in due course in order to provide more opportunities for British machinery exports to the Continent. An example of how this arrangement might be used has been given by the company. A British machine tool maker might be unable to supply a machine to a firm in Italy, for instance, because of inability to offer the necessary credit facilities. Equipment Leasing Co., Ltd., would, however, be able to buy the machine from the maker and it would then be leased to the Italian firm through the European associate company.

Books Received

TECHNICAL OPTICS. By L. C. Martin, D.Sc., A.R.C.S., D.I.C. Sir Isaac Pitman & Sons, Ltd., Parker Street, London, W.C.2. 391 pp. [63s. net.]

In this volume, the design and performance of a number of important optical instruments are considered. The telescope, the microscope, binocular instruments, and photographic lenses are covered, also the photometry of optical systems and the projection of images. Testing of optical instruments and the study of their performances are discussed in detail, and an important chapter is devoted to aspheric surfaces of revolution.

FRENCH MACHINE TOOLS. Edited by Le Syndicat des Constructeurs Francais de Machines-Outils, 150 Boulevard Bineau, Nueilly-sur-Seine, Seine, France.

This well-produced 273-page volume provides a useful directory to the French machine tool industry, and is divided into two main parts. The first part, extending to 76 pages, comprises 114 sections listing the makers of the various types of metal cutting machine tools, sheet and plate-working machinery, presses, tube and wire-working machines, accessories for machine tools, drives, and cutting tools. Here, capacity ranges covered by each firm are listed. In the second section, of 155 pages, brief details and illustrations are included of some 570 machine tools and items of equipment made by nearly 200 firms. There is also an alphabetical list of products in four languages, and alphabetical lists of makers of machine tools, testing and checking machines; degreasing machines; and machine tool accessories and drives. These latter lists have cross references to the main sections.

NEWS OF THE INDUSTRY

Wakefield and District

STAINSBY & LYON, LTD., Knottingley, report increasing calls on their services as contract machinists from various branches of the engineering industry. We are informed that the section engaged in the production of dies and patterns for use in the lost-wax process of casting is extremely busy at present. To enable the works to keep abreast of production requirements a plant augmentation programme has been initiated and the following machines have recently been installed under this scheme: a Ward No. 3A capstan lathe; a Minganti turret lathe; and an Arboga vertical milling machine.

BLACKBURN & CRAWSHAW, Paragon Works, Cravens Street, Wakefield, builders of guillotine shearing machines, plate rolling machines, folding machines and other sheet metal working machinery, inform us that there is a steady demand for their various products and that approximately 50 per cent of the orders in hand are from export markets.

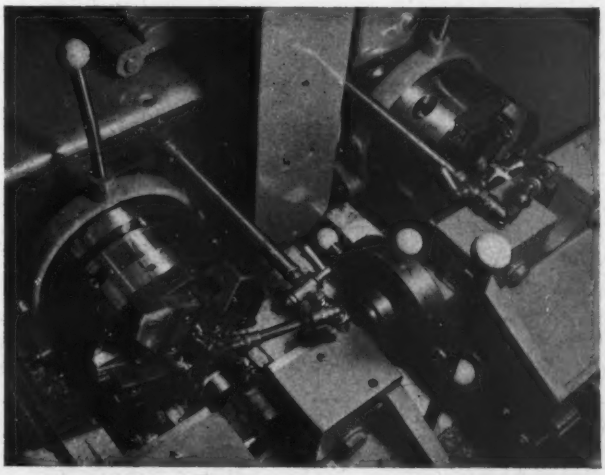
SLATER & CRABTREE, LTD., Elm Tree Works, Belle Vue, Wakefield, who are specialists in the production of press tools, report an increasing demand for such tools, also for other items which include Pivot punches, made under licence from the U.S.A.; and jigs and fixtures, both of their own and customers' designs. Machines recently installed in the works include a 36-in. and a 48-in. capacity Webster & Bennett turning and boring mill, and a No. 4G SIP jig boring machine. In addition, a No. 6A SIP jig borer is due for delivery in a few months' time.

RAYBROOK PRECISION HONING CO., LTD., Durkar Low Lane, Durkar, near Wakefield, are busy with the production of their honing machines which range in capacity from 1 in. to 36 in., and include a standard fixed-spindle cabinet type, a universal type, and various portable machines. Orders in hand include a number for export to several countries. A works extension of some 2,700 sq. ft. has recently been completed and it is expected that production will start in this additional area in a few weeks.

E. GREEN & SONS, LTD., Economiser Works, Calder Vale Road, Wakefield, inform us that their works are maintaining a steady output of the various products, which include economizers, air heaters, dust collectors, fans, and dampers. It was noted that a large re-organization and modernization programme has recently been completed in the foundry which is busy with the production of high-grade heat resistant castings to meet the company's requirements. It is stated, however, that

❖ ❖ ❖

A close-up view of the new MB 2-spindle threading machine, fitted with Lanco type T, 1¼-in. capacity, tangential die-heads, with built-in trip mechanisms, which is being demonstrated by Landis Machine-Maiden, Ltd., Hyde, Cheshire, at the 7th European Machine Tool Exhibition, Brussels. At this set-up, 1-in. diameter B.S.P. taper threads of 11 t.p.i. are cut at both ends of pipe nipples, and, at the same time, the components are reamed and chamfered. The spindle speed is 73·5 r.p.m., and the floor-to-floor time, 15 sec.



a certain amount of capacity is available for jobbing work.

SPENCER & HALSTEAD, LTD., Ossett, near Wakefield, who have been engaged in the production of heating and ventilating plant and shot blasting machinery for more than 50 years, report that they are at present experiencing an increasing demand. Approximately 30 per cent of the works output is regularly exported to various countries overseas.

The shot blasting division produces machines and equipment in a very wide range, from small units for use in the pottery industry up to large installations for foundry work, which will handle components weighing several tons. This division supplies a machine for descaling mill plates up to a maximum of 13 ft. wide by 2 in. thick, which is available as a horizontal or vertical unit. It is stated that there is a keen demand for these machines from the shipbuilding industry, both in the U.K. and in many countries overseas. Large-capacity and special shot blasting plant has recently been supplied to many civil engineering contractors, including machines for handling fabricated sections with dimensions up to 18 ft.

Dust extraction equipment for use in a variety of industries is made by the fan engineering division of the company, and there is an increasing call at present for small individual units for use on separate machines. This department also supplies air conditioning and humidifying plant for the textile, food, and printing industries, and for use in laboratories. Special plant for the textile industry for the pneumatc transportation of fibres and equipment for oiling fibres is stated to be in particularly good demand, especially from the U.S.A.

A new drawing office which is now being built will provide double the area previously available. In addition, a new fabricaton shop, with an area of some 13,500 sq. ft., is under construction, which will be equipped with two 5-ton capacity cranes and plant for operations on steel plate up to ½ in. thick.

R. SUTCLIFFE.

Numerically-controlled Machine Order

It is reported that Douglas Aircraft Co., Inc., Santa Monica, Calif., U.S.A., have placed an order for 11 numerically-controlled profiling machines, the cost of which (3·3 million dollars) will be met by the U.S. Air Force Industrial Modernization Programme. Four additional numerically controlled machines will be purchased with Douglas Co. funds.

As a result of these acquisitions, it is stated, the equipment in one of the Douglas plants on the West Coast will include the following: Seven 5-axis profiling machines, three large 3-axis Di Mil profiling machines, and two 4-axis vertical turret lathes by Giddings & Lewis, and four 4-axis Omnimils by Sundstrand. All these machines will be equipped with Bendix Dynapath solid state control systems, and programming will be carried out with FASCAN (Douglas) and APT computers. Work undertaken will include the machining of complex parts for the Skybolt programme.

To afford an indication of the advantages of numerical control for such operations, the following example is cited. A 1,000-lb. forging was machined on a numerically-controlled G. & L. Variax mill at the Douglas works, to produce a 90-lb. missile component, in 36 hours, and only two settings were required—for operations on the front and rear sides. Previously, it is estimated, this work would have been carried out on eight different conventional milling machines and would have occupied a total of 400 hours. Even then, it is considered, the specified accuracy would not have been obtained.

Engineering Research Register

Last year, the Production Engineering Research Association, Melton Mowbray, Leics., made a study of the need for a World Register of Production Engineering Research to " assist research workers and production engineers to keep fully informed about investigations carried out in research organizations, industrial firms, universities, and colleges throughout the world." Proposals based on the study were presented by the director of research, Dr. D. F. Galloway, to the General Assembly of the International Institution for Production Engineering Research (C.I.R.P.), and it was agreed that such a Register should be compiled as quickly as possible. The extensive work of translating, editing, classifying, and desseminating all information to be incorporated in the register has been entrusted to PERA, and an application for financial support for this work was made to O.E.E.C., which has now agreed to finance the project for a period of two years.

The main subjects covered will be automation, machine tools, materials handling, finishing processes, metal forming, assembly, inspection and measurement, metal cutting, and machinability and formability of materials.

As much information as can be obtained will be included in the Register about establishments carrying out programmes of research relevant to production engineering, including details of the

researches undertaken, staff, workshops, laboratories, special facilities, and equipment. It is expected that it will also be possible to provide information on publications, educational services, and allied matters.

For the purpose of compiling the Register, a questionnaire is being sent to research establishments, industrial organizations, universities, colleges, and trade associations in many parts of the world. Organizations carrying out any form of production engineering research are invited to write to The Information Manager of PERA for a copy of the questionnaire.

It is pointed out that a complete World Register published in various languages will reduce the risk of investigations being duplicated in different parts of the world. It will also ensure that production engineering research facilities and investigators are being most effectively employed in improving production techniques and equipment.

Personal

MR. J. KING has resigned from the position of works manager for Thomas White & Sons, Ltd., Paisley, to join the English Steel Tool Corporation, Ltd., Openshaw Works, Manchester, 11, in a similar capacity.

MR. WILLARD H. SPENCE has resigned from the position of managing director of Brown & Sharpe, Ltd., Plymouth, Devon, and has been succeeded by MR. WILLIAM A. MCGREGOR, who was previously general manager.

MR. F. J. HOWARD, A.M.I.Mech.E., has relinquished the post of works manager of The Globe Pneumatic Engineering Co., Ltd., Harold Hill, Romford, Essex, owing to an internal re-organization, and as technical director will in future concentrate on design. He has been succeeded as works manager by Mr. A. G. Osborn, G.I.Mech.E., and Mr. W. Hogarth has been made assistant works manager.

MR. W. J. BARRETT, the oldest employee of J. H. Dallmeyer, Church End Works, Willesden, London, N.W.10, has retired on pension after completing 55 years' service. It is stated that during this time he became expert in every operation in the optical shop from roughing and slitting the glass plates, to the final cementing and centring of the finished lenses. A presentation was made to Mr. Barrett in 1956 at the end of his 50th year with the company.

The following new appointments have been announced:—

MR. CECIL F. HURST, as assistant managing director of Samuel Osborn & Co., Ltd., Clyde Steel Works, Sheffield, 3. Mr. Hurst is also deputy chairman of the company.

MR. AUBREY R. LEWIS, M.I.Prod.E., general works manager of all the company's production plants, as a divisional director of the Pyrene Co., Ltd., Great West Road, Brentford, Middlesex.

MR. A. J. GREENWAY to the board of L. & T. I. Brock & Co., Ltd., Burnsall Road, Canley, Coventry, as sales director of the precision rollers and pins and needle roller and cam follower division.

MR. P. A. SMITH as technical representative in the North London and Home Counties area for British Central Electrical Co., Ltd., Briticent House, 6 and 8 Rosebery Avenue, London, E.C.1.

MR. B. A. TOMLINSON as representative for Stubs Welding, Ltd., Scotland Road, Warrington, in Nottinghamshire and North Derbyshire, and MR. A. ROONEY as representative in Leicestershire and South Derbyshire.

MR. W. MORRIS, secretary of Colt Ventilation, Ltd., Surbiton, Surrey, and the associated companies, and MR. F. W. PRICE, sales manager of Colt Ventilation, Ltd., and W. H. Colt (London), Ltd., as directors of the Colt associated companies.

Drilling Circuit Boards

In MACHINERY, 98/832—12/4/61 an article was published under the heading "Drilling Printed Circuit Boards". The author, Mr. A. J. Lole, B.Sc.(Eng.), A.M.I.Mech.E., informs us that various modifications and improvements have since been made to this equipment, as a result of which, distinctly better performance is being obtained. When the article was written, the cycle time for a load of 35 boards (with an average of 120 holes each) was 36 min., or slightly more than 1 min. per board. A load is now completed in 20 min., representing 34·3 sec. per board, and output has thus been increased by 80 per cent.

Trade Publications

PRECISION GEAR MACHINES & TOOLS, LTD., Red Ring Works, Bodmin Road, Coventry. Brochure entitled "Progress in Red Ring Gear Inspection" in which the following are illustrated and briefly described. The type GRF gear checker and classifier; the types GRJ and GRH gear rolling fixtures; the type GSC gear speeder with electronic noise indicator; and the latest design of involute checker.

ROCKWELL MACHINE TOOL CO., LTD., Welsh Harp, Edgware Road, London, N.W.2. Very well illustrated brochure of 12 pages describing the Fritz Werner size 2D and 3, knee-type, horizontal, universal, and vertical milling machines. Attention is drawn to the principal features, and separate sections are devoted to standard and special equipment. Various accessories are also shown including vertical and universal heads, rack milling and slotting attachments, circular tables, and motorized overarms.

TECHNOGRAPH ELECTRONIC PRODUCTS, LTD., Fleet, Aldershot, Hants. Brochure which has been prepared to provide a guide to the manufacturers of equipment incorporating printed circuits, also to buyers of the latter components. Various types of printed circuits are described, and other sections are concerned with: standard tolerances for printed circuits and relative costs for various degrees of accuracy; specifications for electro-plating, and data on other types of finishing processes; servicing printed circuits; aspects of the company's automatic plant; and the design and prototype services which are offered. Separate leaflets in a pocket at the end of the brochure deal with specific types of printed circuits and manufacturing processes.

Industrial Notes

J. H. Fenner & Co., Ltd., Marfleet, Hull, inform us that the Telex number of their Glasgow branch is 77269.

Ekco Plastics, Ltd.—The address of the London office of this company is now 41-47 Old Street, E.C.1.

Department of Scientific and Industrial Research have moved to State House, High Holborn, London, W.C.1 (telephone, Chancery 1262).

Black & Decker, Ltd., have opened a new service branch at 1 Brixton Road, London, S.W.9, which is additional to those at Harmondsworth and Holloway Road.

Haesler Sales Division of Adam Engineering Co., Ltd., 4 Grange Road, St. Albans, Herts., have been appointed sole selling agents in Great Britain for the type SO precision cylindrical grinding machine built by Beling & Lubke, Berlin.

Chaphone Engineering Developments, Ltd., have moved to recently completed offices above their works. The address of the company is now Reddicap Industrial Estate, Sutton Coldfield. The telephone number (Sutton Coldfield 1090) has not been changed.

An Auction Sale of Machine Tools and miscellaneous stores from the Technical Stores Depot, Old Dalby, Leics., will be held at Melton Mowbray on September 21. The auctioneers will be Shouler & Son (Dept. L), 1 Norman Street, Melton Mowbray, Leics.

Iron Castings Production. It is announced by the Iron and Steel Board that the production of iron castings in the second quarter of this year amounted to 1,007,030 tons, as compared with 1,006,310 tons in the corresponding period of 1960.

Ormerod Engineers, Ltd., Shawclough, Rochdale, have received an order, valued at £50,000, for 56 electrically-operated loading winches from Blackburn Aircraft, Ltd. These winches are of the type used for freight handling on the Blackburn Beverley transport aircraft.

Townsend-Coates, Ltd., 167 London Road, Leicester, have been appointed sole representatives for the United Kingdom for the products of The Snyder Corporation, Detroit, Michigan, U.S.A. These products include line and dial indexing; trunnion type; centre column; transfer; boring; and turning machines; also balance milling machines for pistons and connecting rods; and special machines for many other applications.

FAG Bearing Co., Ltd., Macrome Road, Green Lane, Tettenhall, Wolverhampton, announce that, in common with their associate companies in Western Germany, Canada, and Eire, they are adopting a revised form of their trademark. The diamond is no longer employed, and the letters FAG are of more modern style.

It may also be noted that a new depot has been opened at 92 Broughty Ferry Road, Dundee (telephone, Dundee 83745), and that the branch formerly located in North Shields has been transferred to centrally situated premises at 16 Dean Street, Newcastle upon Tyne, 1 (telephone, Newcastle 24612).

Woods of Colchester, Ltd., Braiswick Works, Colchester, inform us that a new form of mounting, comprising four pressed steel arms, has been developed for their propeller fans in sizes of 9, 12, 15, and 18 in. diameter. This mounting, it is stated provides improved resilient suspension, which contributes to quiet running.

Andrew Field & Co., Ltd., 17 Easton Street, High Wycombe, Bucks., have introduced a new type of self-drilling concrete fastener, which is marketed under the name Anchorfast. The anchor is provided with cutting teeth, and after drilling has been completed, it is expanded by driving it home over a taper plug.

Hedin, Ltd., Commerce Estate, South Woodford, London, E.18, have taken over additional office and works accommodation at Fowler Road, Hainault, Essex. In future, furnaces and ovens will be made at Hainault, and the South Woodford works will be concerned with the manufacture of industrial heating elements and resistances.

Cooper & Turner, Ltd., Vulcan Works, Vulcan Road, Sheffield, 9, have introduced a new range of drilled, semi-tubular rivets. These rivets are being produced in mild steel, copper, brass and aluminium alloys to British Standard specifications, and can be supplied with special head shapes and sizes when required. Sizes range from $\frac{1}{8}$ to $\frac{3}{8}$ in. diameter and lengths up to $6\frac{1}{2}$ in.

Ruston & Hornsby, Ltd., Lincoln, report that two Ruston TA gas turbines, installed in the pump station of gathering centre No. 13 at the Burgan oilfield of the Kuwait Oil Co., and running on natural gas, have each been in operation for more than 21,000 hours without being opened up. There is still no indication of performance deterioration, and no evidence that internal inspection is needed.

The 9th International Automobile Technical Congress of the Fédération Internationale des Sociétés des Techniques de l'Automobile (FISITA) will be held in this country from April 30 to May 5. Full information can be had from FISITA, Congress Secretariat, The Institution of Mechanical Engineers, Automobile Division, 1 Birdcage Walk, Westminster, London, S.W.1.

The Combustion Engineering Association, 70 Jermyn Street, London, S.W.1, have arranged for a working display of modern equipment for the mechanical handling of coal and ash to be staged at Salford Goods Station, East Ordsall Lane Entrance, Salford, from September 19 to 21 (10 a.m. to 12.30 p.m., and 2.30 to 4.30 p.m.). Admission will be free, and invitation cards are obtainable from the above address.

British Institute of Management, 80 Fetter Lane, London, E.C.4. The 16th National Conference of the Institute will be held in Torquay from October 24 to 26. The subjects of papers will include: management and technical change; the essentials of overseas trading today; new trends in management training—industrial programmes; management and quality performance; management and automation; presenting information to employees; personal initiative in the smaller firm; and "a European look at British marketing methods".

EXPORTING TO EAST AFRICA is the title of a supplement to the *Board of Trade Journal* for August 25. This survey, which has been issued on the recommendation of the Export Publicity Council, is intended particularly to aid new exporters to the area, and gives topographical, economic and political information about Kenya, Uganda, and Tanganyika. Copies are obtainable, free of charge, from the Export Publicity and Fairs Branch, Board of Trade, Horse Guards Avenue, London, S.W.1.

BOROUGH POLYTECHNIC, Borough Road, London, S.E.1, have arranged a course of six lectures on "The Technique of Technical Writing" on Friday afternoons at 2.30 p.m., starting on October 20 (fee 10s.). Another course, of ten lectures, will be concerned with "Effective Speaking." These lectures will be held on Monday evenings at 7 p.m., starting on October 9 (fee 20s.). Further particulars and application forms can be obtained from the secretary at the above address.

VACTRIC CONTROL EQUIPMENT, LTD.—At the time of the acquisition of the share capital of Vactric Control Equipment, Ltd., by the News of the World Organisation, it was mentioned that it was planned to expand the company's facilities. Extensive premises have now been acquired by the company at Garth Road, Morden, Surrey, and a new block to house the Development and Applied Research Departments is to be provided as soon as possible. As additional space becomes available, the company will gradually concentrate all activities into this area.

STANDARD FOR PEARLITIC MALLEABLE IRON CASTINGS.—B.S. 3333: 1961 lays down a level of quality for pearlitic malleable iron castings and appropriate tests. Castings are divided into two grades, and requirements and tests for tensile strength, permanent set stress, elongation, and hardness are specified for each grade, also requirements for microstructure, workmanship, and finish of castings. Copies of the specification may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1. (Price 4s. 6d.—postage extra to non-subscribers.)

MULLARD EQUIPMENT, LTD., inform us that the commercial divisions and most of the production staff will move to the new factory at Manor Royal, Crawley, Sussex, on September 4. For the time being, two of the company's premises will be maintained at Wandsworth. The new factory, of 134,000 sq. ft., is built on a 17-acre site which will provide for future expansion. Products of this factory will include communications and radar equipment, industrial control systems and sub-assemblies, linear accelerators, ultrasonic equipment, nucleonic instruments and equipment, and electronic measuring and test apparatus.

COLOUR FILMS ON BROACHING.—Three colour films on various aspects of broaching are now available from Lapointe Machine Tool Co., Ltd., Watford, Herts. These films were made by the Lapointe Machine Co., U.S.A., and dubbed commentaries have been provided by Trent Film Productions, for the benefit of English audiences. The titles of the films are "Precision Broaching for Production and Profit" (running time, 40 min.); "Texas Tower" (running time, 20 min.)—describing a special 20-station machine; and "Helicopter Spar Broaching" (running time, 20 min.)—concerned with the finishing of the interior profile of a helicopter spar by broaching.

MACHINERY'S ENQUIRY BUREAU

For many years MACHINERY has provided an enquiry service not only for subscribers and advertisers but for all engineers in need of such information as the names of makers—or their agents—of machines or equipment for performing particular operations, suppliers of various classes of material, firms with facilities for undertaking certain types of work, owners of trade names, and agents for foreign machine builders. If you have such a problem write (MACHINERY, Enquiry Bureau, Clifton House, 83-117 Euston Road, London, N.W.1) or telephone (Euston 8441, 2 lines). This service is, of course, entirely free.

The Price of a Subscription to MACHINERY is 52 Shillings per annum, post free, to any part of the world.

Subscribers are not bound for any definite period of subscription. We send MACHINERY, post free, each week until told to stop. Subscribers can pay yearly, half-yearly, or quarterly, pro rata. (Cash with order.)

To MACHINERY, National House, 21 West Street, Brighton 1.

Please send me/us MACHINERY every week until I/we tell you to stop, for which I/we enclose remittance of 52 Shillings per annum or pro rata

Name .....

Address .....

.....

**Position* .....

**Firm* .....

*For our mailing records only.

MACHINERY can be obtained by single copies or subscription through your local newsagent.

6/9/61

MANUSCRIPTS FOR BOOKS covering all branches of engineering production will receive careful consideration and should be sent to the Manager, Book Dept., MACHINERY, National House, 21 West Street, Brighton, 1.

CONDITIONS OF SALE AND SUPPLY.—MACHINERY is sold subject to the following conditions:

That it shall not, without the written consent of the publishers first given, be lent, resold, hired out or otherwise disposed of by way of trade except at the full retail price of 1s. 3d. and, that it shall not be lent, resold, hired out or otherwise disposed of in a mutilated condition or in an unauthorised cover by way of trade; or affixed to or as part of any publication or advertising literary or pictorial matter whatsoever.

Machine Tool Exports and Imports

EXPORTS OF MACHINE TOOLS

Type of Machine	Month ended June 30, 1961	Six months ended June 30	
		1960	1961
	Value £	Value £	Value £
New, complete:—			
Bar and chucking automatics	33,999	372,699	535,613
Boring machines:			
Vertical	35,180	191,274	568,205
Other	71,788	724,774	526,482
Drilling machines	82,231	724,690	724,446
Gear-cutting machines	113,230	502,486	531,250
Grinding, lapping and honing machines	300,357	1,310,704	1,791,448
Lathes:			
Capstan and turret	217,343	1,067,430	1,564,049
Other	303,414	2,017,121	2,175,052
Milling machines	296,033	1,050,708	1,475,180
Planing machines	42,920	125,365	217,899
Presses:			
Hydraulic	74,090	696,349	494,458
Other	93,649	1,210,708	680,410
Punching and shearing machines	29,928	286,604	376,642
Other plate and sheet-metal working machines, including straightening rolls	55,123	364,126	393,818
Screwing and threading machines	70,000	377,929	468,786
Shaping and slotting machines	32,467	208,616	229,435
All other machines	249,616	1,203,829	1,770,810
Used, complete	51,787	640,168	417,877
Parts	269,153	1,478,439	2,054,591
Total	2,422,508	14,554,019	16,996,451
Destination			
Union of South Africa	93,198	634,309	796,085
India	325,524	1,831,686	2,395,853
Australia	179,351	3,340,564	2,298,134
New Zealand	88,276	223,443	448,246
Canada	106,784	706,272	785,261
Other Commonwealth countries	119,240	805,263	957,686
Soviet Union	23,465	209,251	489,849
Sweden	86,370	321,264	599,546
Western Germany	155,715	441,467	916,059
Netherlands	49,752	265,428	425,702
France	141,463	756,131	778,161
Spain	84,129	243,009	490,718
Italy	196,100	365,034	1,194,312
United States of America	83,259	1,332,648	639,737
Other foreign countries	689,882	3,078,250	3,781,102

IMPORTS OF MACHINE TOOLS

New, complete:—			
Bar and chucking automatics	88,823	274,855	500,874
Boring machines	115,964	819,615	777,590
Drilling machines	53,104	129,958	233,447
Gear-cutting machines	80,966	355,622	1,173,110
Grinding, lapping and honing machines	264,830	2,000,407	2,414,413
Lathes	296,453	1,047,407	1,727,573
Milling machines	346,629	1,480,255	1,671,558
Planing, shaping and slotting machines	41,770	213,085	342,004
Presses	200,310	726,824	1,022,471
All other machines	531,773	1,953,232	3,190,372
Used machines, complete	44,049	501,399	431,504
Parts	364,980	1,567,523	1,940,857
Total	2,429,651	11,070,182	15,425,773
Country of Origin			
Western Germany	812,978	3,354,425	4,374,950
Switzerland	195,727	1,572,968	1,618,492
U.S. America	826,200	4,122,276	6,311,439
Other countries	594,746	2,020,513	3,120,892

Licensing Agreement for Brazil

Mr. Gordon B. Coleman, principal of Brazilian Trade Consultants, is making a stay of a few months in this country, and his temporary address here is 17 Farm Avenue, North Harrow, Middlesex. He wishes to get in touch with British industrialists who have an interest in the South American and particularly the Brazilian market. In this connection it is stated that whereas Mr. Coleman's organization can sometimes be of help to those wishing to export, it is primarily concerned with assisting companies which are prepared to consider some form of local manufacture, and especially with arranging licensing and other agreements in Brazil and/or other South American countries.

Correction

"PROPULSION" PRODUCT RANGE. In MACHINERY, 98/451—23/8/61, reference was made to the activities of Propulsion, The Lodge, Greenbank Mills, Greengate Street, Oldham, and it was stated that propellers and stern-gear equipment were produced in a range of sizes from 10 to 50 b.h.p. This should have read 10 to 250 b.h.p.

Scrap Metals

MIDLANDS.—Trading in ferrous scrap is at present very limited on account of the lack of demand, and only cast iron material is moving freely to local foundries.

Allocations covering deliveries to steelworks are insufficient to absorb all scrap that is forthcoming and merchants are finding it necessary to stock surplus tonnage. At one local steelworks no deliveries are being taken of grades No. 1 and 2 heavy steel, and pressable scrap of grades No. 3, 6, and 8 can be delivered by road only. The acceptances by road are restricted and merchants have to comply with allocations which are indicated weekly.

Demand for No. 4 bales is weak, and in consequence the prices paid by merchants for new production light steel cuttings have fallen by 10s. or more per ton.

Foundry short heavy steel scrap is very difficult to place, because allocations have been cut by many foundries to a bare minimum, and in some cases complete stoppages are in operation. The lower grade shovelling scrap is now definitely only suitable for delivery to steelworks as grade No. 3 material, and merchants are entering into new purchase contracts on this basis.

Cast iron of all grades presents no problems, but some foundries are building up stocks due to heavier deliveries immediately after the holiday close-down.

Both chipped and bushy turnings are hard to place as allocations from blast furnaces are so limited. Prices for bushy turnings in particular are likely to fall considerably if merchants cannot find more openings for direct delivery of this grade.

Loose destructor scrap is not sought on account of the difficulties in disposing of the baled materials, and particularly the larger bales of 24 by 18 by 12 in. Such interest as is shown is mainly limited to the 12 in. cube size.

In general no improvement in the markets can be anticipated for the next few weeks.

Machine Tool Share Market

Apart from the gilt-edged section, which developed firmness, quiet and generally dull conditions prevailed in stock markets during the period under review.

The Berlin situation, coupled with the uncertain business outlook at home, were the major adverse influences.

After an unfavourable start, gilt-edged stocks became fairly active, and by the finish, good gains had been established among British Funds and kindred issues.

Industrial markets were depressed, and for the most part share prices tended to fall. There was some resistance to the downward drift, but changes on balance were irregular, with declines predominating.

Among machine tool issues, Edgar Allen lost 9d. at 34s. 6d.; Asquith Machine Tool, 3d. at 9s.; Birmingham Small Arms, 6d. at 22s.; British Oxygen, 6d. at 18s.; Chas Churchill, 1½d. at 8s. 10½d.; Clarkson (Engineers), 3d. at 6s. 3d.; Coventry Gauge & Tool, 3d. at 28s. 1½d.; Craven Bros. (Manchester), 3d. at 8s. 3d.; Kerry's (Gt. Britain), 3d. at 8s. 9d.; Newall Engineering, 3d. at 7s.; Samuel Osborn, 1s. at 47s. 6d.; Ambrose Shardlow, 7½d. at 56s. 3d.; and John Shaw & Sons (Wolverhampton), 3d. at 15s. 1½d. On the other hand Geo Cohen advanced 3d. to 11s.; John Harper, 1½d. to 6s. 10½d.; and Sanderson Kayser, 3s. 1½d. to 32s. 6d.

BUCK & HICKMAN, LTD. Interim dividend 4 per cent.

W. E. SYKES, Ltd. Dividend of 20 per cent for the year ended April 30.

New Companies Registered*

S.G.F. TOOLS LTD. 1 Langley Road, Staines, Middlesex. Registered August 10, 1961. Nom. cap.: £2,000 in £1 shares. Directors: S. L. Isaac, G. J. Isaac, and F. J. Isaac.

AJAX OF COVENTRY, LTD. Registered August 14, 1961. To carry on the business of manufacturers of and dealers in jigs, tools, etc. Nom. cap.: £12,000 in £1 shares. Directors: not named. Subscribers: D. F. Gallaher, 20 Cunningham Avenue, St. Albans and R. Southcombe, 16 Bishops Avenue, Northwood, Middlesex.

BRAKES AND BEARINGS, LTD. Registered August 10, 1961. Nom. cap.: £10,000 in £1 shares. Directors to be appointed by subscribers. Subscribers: A. C. Ball, New Lodge, Trent Valley Road, Oakhill, Stoke-on-Trent and A. P. Myers, Sutherland House, Grinderley Lane, Blythe Bridge, Stoke-on-Trent.

* From the lists compiled by Jordan & Sons, Ltd., Company Registration Agents, 116-118 Chancery Lane, London, W.C.2.

COMPANY		Denom.	Middle Price
Abwood Machine Tools, Ltd.	Ord.	1/-	1/6
Allen (Edgar) & Co., Ltd.	Ord.	£1	34/6
" "	5% Prf.	£1	13/6*
Arnott & Harrison, Ltd.	Ord.	4/-	10/3
Asquith Machine Tool Corp., Ltd.	Ord.	5/-	9/-
" " "	6% Cum. Prf.	£1	16/6
Birmingham Small Arms Co., Ltd.	Ord.	10/-	22/-
" " "	5% Cum. "A" Prf.	£1	14/-
" " "	6% Cum. "B" Prf.	£1	16/-
" " "	4% 1st Mort. Deb.	Stk.	98½
British Oxygen Co., Ltd.	Ord.	5/-	18/-
" " "	6% Cum. Prf.	£1	18/6
Brooke Tool Manufacturing Co., Ltd.	Ord.	5/-	8/10½
Broom & Wade, Ltd.	Ord.	5/-	24/9
" "	6% Cum. Prf.	£1	16/6
Brown (David) Corporation, Ltd.	5½% Cum. Prf.	£1	15/-
Buck & Hickman, Ltd.	6% Cum. Prf.	£1	17/-
Butler Machine Tool Co., Ltd.	Ord.	5/-	15/-
" "	5% Cum. Prf.	£1	12/6
Churchill (Charles) & Co., Ltd.	Ord.	2/-	8/10½
" " "	6% Cum. Prf.	£1	25/7½‡
Clarkson (Engrs.), Ltd.	Ord.	5/-	6/3
Cohen (George), 600 Group, Ltd.	Ord.	5/-	11/-
" " "	4½% Cum. Prf.	£1	11/6
Coventry Gauge & Tool Co., Ltd.	Ord.	10/-	28/11½
" " "	5% Cum. Red. Prf.	£1	16/3
Craven Bros. (Manchester), Ltd.	Ord.	5/-	8/3
Elliott (B.) & Co., Ltd.	Ord.	1/-	2/6
" "	4½% Red. Cum. Prf.	£1	12/-
Firth Brown Tools, Ltd.	4% Cum. Prf.	£1	10/-
Greenwood & Batley, Ltd.	Ord.	10/-	17/9
Harper (John) & Co., Ltd.	Ord.	5/-	6/10½
" " "	4½% Red. Cum. Prf.	£1	10/-
Herbert (Alfred), Ltd.	Ord.	£1	67/6
Holroyd (John) & Co., Ltd.	"A" Ord.	5/-	20/-
" "	"B" Ord.	5/-	17/6
Jones (A. A.) & Shipman, Ltd.	Ord.	5/-	24/6
" " "	7% Cum. Prf.	5/-	4/9
Kearney & Trecker-C.V.A., Ltd.	5½% Red. Cum. Prf.	£1	8/9
" "	Prefd. Ord.	£1	13/9
Kearns (H. W.) & Co., Ltd.	Ord.	5/-	21/3
Kerry's (Gt. Britain), Ltd.	Ord.	5/-	8/9
Macreadys Metal Co., Ltd.	Ord.	5/-	15/-
Martin Bros. (Machinery), Ltd.	Ord.	2/-	2/6
Massey (B. & S.), Ltd.	Ord.	5/-	10/6
Newall Engineering Co., Ltd.	Ord.	2/-	7/-
Newman Industries, Ltd.	Ord.	2/-	7/-
" "	6% Prf. Ord.	5/-	5/-
Noble & Lund, Ltd.	Ord.	2/-	5/9
Norton, W. E. (Holdings), Ltd.	Ord.	2/-	8/-
Osborn (Samuel) & Co., Ltd.	Ord.	5/-	47/6
" "	5½% Cum. Prf.	£1	22/3
Pratt (F.) & Co., Ltd.	Ord.	5/-	16/3
Sanderson Kayser, Ltd.	Ord.	10/-	32/6
" "	6½% Cum. Prf.	£1	16/3
Scottish Machine Tool Corporation, Ltd.	Ord.	4/-	8/6
Shardlow (Ambrose) & Co., Ltd.	Ord.	£1	56/3
Shaw (John) & Sons, Wolverhampton, Ltd.	Ord.	5/-	15/1½xd
Sheffield Twist Drill & Steel Co., Ltd.	Ord.	4/-	19/-
" " "	5% Cum. Prf.	£1	13/3
Stedall & Co., Ltd.	Ord.	5/-	7/6
Sykes (W. E.), Ltd.	"B" non-voting Ord.	10/-	28/3
Tap & Die Corporation, Ltd.	Ord.	5/-	15/6
" " "	4½% Deb. 1961-1977	Stk.	80½
Wadkin, Ltd.	Ord.	10/-	26/-
Ward (Thos. W.), Ltd.	Ord.	£1	72/6
" "	5% Cum. 1st Pref.	£1	13/6
" "	5% Cum. 2nd Pref.	£1	20/-
Willson Lathes, Ltd.	Ord.	1/-	3/-xd

The Middle Prices given in the list are in several cases nominal prices only and not actual dealing prices. Every effort is made to ensure accuracy, but no liability can be accepted for any error. * Sheffield price. ‡ Birmingham price.

PRICES OF MATERIALS

All prices per ton except where otherwise stated.

Pig Iron* (10 tons or over)

Foundry and Forge No. 3, Class 2

Middlesbrough	£21 17 0
Birmingham (10 tons or over)	£21 9 3

Phos. Over 0·1 up to 0·4%

Birmingham	£23 5 0
Grangemouth	£23 10 0

Hæmatite

N.E. Coast (made in N.E.)	£23 19
Scotland (made in Scotland, zone S.1.)	£24 5 6
Sheffield	£25 9 0
Birmingham	£25 13 0
S. Wales (made in Wales)	£23 19 0

Steel Products*

Medium plates (50 tons and over)	£43 16 6
Mild steel plates, ordinary (50 tons and over)	£40 7 0
Boiler plates (50 tons and over)	£42 17 0
Flat bars, 5 in. wide and under (50 tons or over)	£39 1 0
Round bars, under 3 in. (50 tons or over)	£39 1 0
Billets, rolling quality, soft U.T. (100 tons or over)	£31 15 6

Phosphor Bronze

Ingots (2B8) (A.I.D.) d/d	£319 0 0

Copper

Cash (mean)	£232 17 6
Cold rolled and hot rolled sheets 4 ft by. 2 ft. by 10 SWG	£306 10 0—£306 15 0
Rods, $\frac{7}{16}$ in. to $\frac{1}{2}$ in. diam	£325 0 0
Tubes, $1\frac{1}{2}$ in. bore by 10 SWG, ton lots, per lb.	3s. $1\frac{1}{2}$d
Wire rod, black, hot-rolled ($\frac{1}{2}$–$\frac{7}{16}$ in.), English	£248 7 6

Zinc

Refined, minimum 98 per cent purity, current month (mean)	£75 11 3

Brass

Tubes, solid drawn, basis per lb.	1s. $9\frac{1}{2}$d.
Strip 63/37, 6in. by 10 SWG coils, ton lots	£256 10 0—£259 10 0
Rods, $\frac{1}{2}$-3 in. diam. (59 per cent copper)	2s. $0\frac{1}{2}$d.

Yellow Metal

Condenser plates, per ton	£186 0 0
Rods, per lb.	2s. $1\frac{1}{2}$d.

Aluminium

Ingots, min. 99·5 per cent Canadian d/d	£186 0 0

Tinplates

**U.K. Home trade: Cold reduced, f.o.r. makers works (15-50 tons)	£3 6 8
U.K. Export: Hot rolled basis, f.o.r. works port	73s. 6d.—76s. 0d.
Cold reduced basis, f.o.r. works port	73s. 6d.—76s. 0d.

Gunmetal

Ingots, B.S. 1400 L.G.2, delivered	£219 0 0

* Subject to increase of 1 per cent.

** Subject to allowances and extras.

MAKERS' PRICES

Hexagon Steel Bars[1]

Sizes in inches from 1 in. up to 2·21 and 2·41 a/f ex works, 2 tons basis	£42 17 6†
Free cutting black	£46 14 6†

Reeled Steel Bars[1]

Single-reeled, $1\frac{1}{2}$ in. upwards, f.o.t. works (+ usual extra for sizes)	£43 9 0†
Free cutting	£47 7 0†

Precision-ground Mild Steel[2]

1-in. diam ±0·00025-in. 4-ton lots, per cwt.	124s. 6d.†

Bright Ground Stainless Steel Bars[3]

EN56AM (martensitic, free cutting)	£304 10 0
EN58AM (austenitic free cutting)	£377 10 0

Prices are basic, subject to extras.

High-speed Steel

Black random length bar. All prices basic, per lb., subject to extras:

Molybdenum "66"	6s. 5d.
Molybdenum "46"	6s. 3d.
14 per cent tungsten	6s. 11d.
16 per cent tungsten	7s. 4d.
18 per cent tungsten	7s. 9d.
22 per cent tungsten	9s. 2d
5 per cent cobalt	10s. 10d.
4·75/5·25 molybdenum + 6·0/6·75 tungsten + 1·75/2·05 vanadium per cent (5-6-2)	6s. 7d.

Precision-ground, High-speed Free-turning Brass Rod[2]

$\frac{1}{8}$-in. diam. ±0·00025-in., 2 ton lots, per lb.	2s. $7\frac{1}{2}$d.

Grey Iron Rod

Die Cast[4] in random lengths 18 in. to 26 in. rough machined $\frac{1}{8}$ in. to $\frac{1}{16}$ in. above listed size, according to diameter. Extra for definite lengths.

	Per cwt. delivered. Mark I	Mark III
1 or $1\frac{1}{8}$ in.	208s. 0d.	266s. 3d.
$1\frac{1}{4}$ to $1\frac{1}{2}$ in.	145s. 6d.	181s. 6d.
$1\frac{5}{8}$ to 2 in.	112s. 6d.	132s. 6d.
$2\frac{1}{8}$ to $3\frac{1}{2}$ in.	96s. 6d.	112s. 6d.
$3\frac{5}{8}$ to 14 in.	90s. 9d.	105s. 0d.

Continuous Cast[5]

10-ft. lengths centreless ground +0·010 in. Extra for hardenable alloy iron.

	Per cwt. net.
1 or $1\frac{1}{8}$ in.	208s. 4d.
$1\frac{1}{4}$ to $1\frac{1}{2}$ in.	146s. 3d.
$1\frac{5}{8}$ to 2 in.	112s. 7d.
$2\frac{1}{8}$ to $3\frac{1}{2}$ in.	97s. 1d.

Stellite[6]

Welding Rods, plain

$\frac{1}{4}$ in. diam., per lb.	30s. 0d.

Toolbits

$\frac{1}{4}$ in. sq. × 4 in., each	22s. 3d.

[1] Colvilles, Ltd., Glasgow, and 17 Grosvenor Street, London, W.1. [2] Pratt, Levick & Co., Ltd., Chester. [3] Spartan Steel & Alloys, Ltd., St. Stephens Street, Birmingham, 6. [4] Metals & Alloys (Birmingham), Ltd., Minworth, Sutton Coldfield. [5] "Flocast," Harold Andrews Sheepbridge, Ltd., Halesowen. [6] Deloro Stellite, Ltd., Highlands Road, Shirley, Solihull.

† Plus 1 per cent.

BASIC PRICES FROM LONDON STOCK[6]

Free Cutting Steel

Bright cold drawn: (Usaspead) over 1 to 2 in.	£59 4 6‡
Lead bearing (Usaled)	£63 11 0‡
Precision ground, $1\frac{1}{8}$ in.	£84 14 6‡

Bright Drawn

M.S. bars (M.M.C.) over $1\frac{1}{4}$ to 2 in.	£56 10 0‡
Square edge flats (Usaflat)	£73 6 6‡
M.S. angles (Usaspead)	£100 6 6‡
Case hardening (EN) (Usacase) over $1\frac{1}{4}$ to 2 in.	£62 10 0‡
M.S. bars (EN3B) (Usamild) over $1\frac{1}{4}$ to 2 in.	£58 16 6‡
Carbon manganese semi-free cutting case hardening (EN202) (Usaspead 202) over $1\frac{1}{4}$ to 2 in.	£71 5 0‡
35/45 ton tensile (EN6) (Usen) over 1 to $1\frac{1}{4}$ in.	£67 3 0‡
0·4 carbon normalized (Usaspead "40") over $1\frac{1}{4}$ to 2 in.	£69 5 0‡
0·45 carbon normalized EN9 (Usaspead 55)	£69 15 0‡
Carbon manganese steel to Specification EN16T (Usaspead 5565), per ton	£127 1 6

Ground Flat Stock

18-, 24-, and 36-in. lengths (Usaspead). List prices plus 10 per cent. less 5 per cent.

Oil Hardening Cast Steel

Non-shrink (Usaspead N.S.O.H.), $\frac{3}{4}$ in. to $2\frac{1}{2}$ in. per lb.	1s. 11d.
Non-distorting heavy duty (Usaspead H.C.H.C.), $\frac{3}{4}$ in. to $2\frac{1}{2}$ in., per lb.	4s. 2d.

Silver Steel

(0·194-in. to $1\frac{1}{4}$-in.).

Genuine Stubs quality, per lb.	4s. 10d. less 27½%
M.M.C. quality, per lb.	2s. 8d. + 6½%
Boxes of 16 assorted sizes, $\frac{1}{16}$ in. to $\frac{3}{4}$ in. diam.	7s. 6d.

Stainless Steel

KE40AM (free cutting), per lb.	3s. 4d.

Glacier Machined Bronze Bars

Phosphor bronze (2B8) } Prices on
Lead bronze } application

High-speed Steel

18 per cent tungsten. Prices on application

Toolholder bits:

Usaspead "Super" }
" "Supreme" } List price
" Cobalt 10 }

Shimstock

Steel assorted, per tin	3s. 6d.
Brass " "	7s. 3d.

[6] Macready's Metal Co., Ltd., Pentonville Road, N.1. Subject to confirmation by London Office. Delivered free by van in London area.

‡ Plus 1 per cent.

M
e

9 4 6‡
3 11 0‡
4 14 6‡

6 10 0‡
3 6 6‡
0 6 6‡
2 10 0‡
3 16 6‡
ng
ad
5 0‡
7 3 0‡
9 5 0‡
9 15 0‡
7 1 6

1s. 11d.

4s. 2d.

ss 27½%
+ 6¼%

7s. 6d.

3s. 4d.

Bars

ices on
plication

plication

t price

3s. 6d.
7s. 3d.

ntonville
tion by
van in

Cut power loss and down time

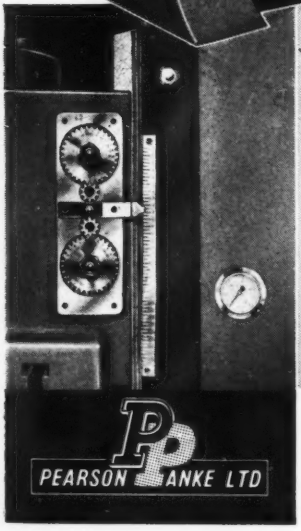
caused by
wear and wastage in
the friction drive

WEINGARTEN

PERCUSSION PRESSES

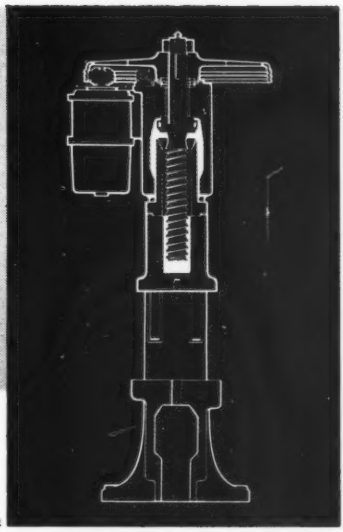
outdate Friction Screw Presses!...

for Embossing, Sizing
and Hot Working



Ram Stroke Adjustment
The strength of blow is set to a calibrated setting scale.

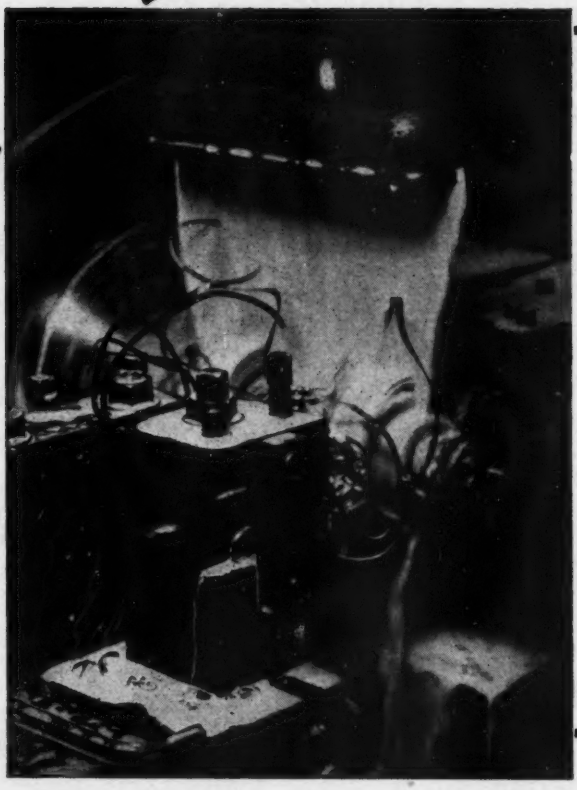
All the energy of all the moving parts is available for the percussion blow.



1-3 HALE GROVE GARDENS,
LONDON, N.W.7
Tel: Mill Hill 3232 Telex: 23273

NRP 5252

A copious flow of coolant is essential to machining efficiency



It is easy to maintain the effectiveness of cutting fluid systems on machine tools by flushing them twice a year with hot SOLVEX solution. This degreasant quickly removes all fatty deposits from supply pipes, and sumps, ensuring the good strong flow which is so necessary to machining efficiency. Whilst you are about it, it is as well to treat centralised mixing and distribution systems too. The cost is negligible and the results are remarkable.

coolant systems need flushing regularly with hot

Solvex SOLUTION

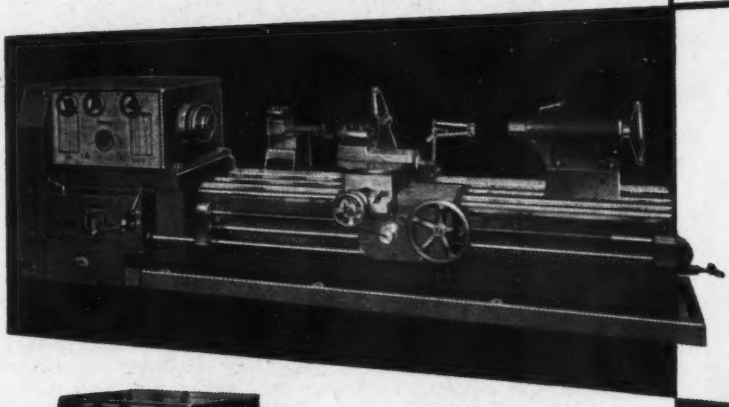
FLETCHER MILLER LTD., ALMA MILLS, HYDE, CHESHIRE.
Telephone: HYDE 3471 (5 LINES) *Telegrams:* EMULSION, HYDE

Also at LONDON, WEST BROMWICH, NEWCASTLE-ON-TYNE, CARDIFF, GLASGOW AND BELFAST

N 153

2 lathes in 1

The NEW STANLEY Sliding Bed Lathe provides the service of TWO lathes ...



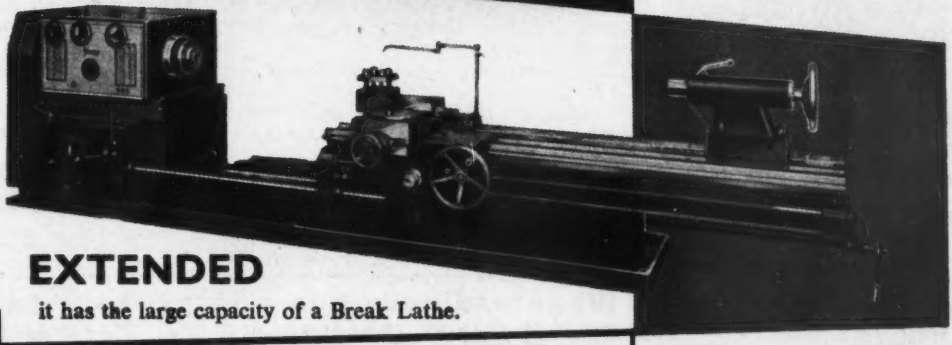
CLOSED

it is handy enough for normal centre lathe work.

Built to Schlesinger limits.

3 sizes 10½, 12½ and 14½.

Any model can be supplied with or without back bed.



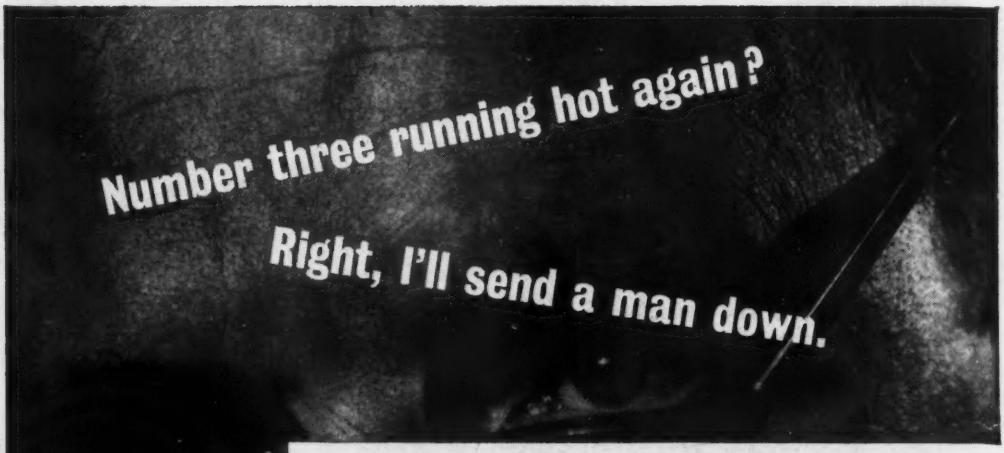
EXTENDED

it has the large capacity of a Break Lathe.

Our service engineer will visit your works anywhere in Gt. Britain to check the machine after installation.

Stanley

THE STANLEY MACHINE TOOL CO. LTD., Halifax, Yorkshire *Phone Halifax 6-7233*



DO *YOU* ACCEPT 'ROUTINE' BREAKDOWNS AS INEVITABLE?

Take any heavily stressed bearing — there'll be several in your works. Pressure, heat, or the washing action of water or chemicals breaks down the lubricant cushion between bearing surfaces. Rapid metal to metal wear takes place and the bearing fails — so frequently that *you now accept it as a normal, inevitable rate of replacement.* Call it component failure? That's the outcome, certainly—*but the cause is lubrication breakdown.*

This is where Molytone Grease goes into action. Combining Molybdenum Disulphide with highest quality, all-purpose non-melting grease, it is tough, stable, and long wearing, easily withstands extremes of pressure and temperature—often cutting maintenance frequency by more than half.

Here's just one of the problems solved by MOLYTONE GREASE. Number of replacement bearings reduced to ONE FORTIETH.

Industry: IRON & STEEL
Problem: Lubrication of 14" mill fabric bearings constantly washed with water. Average replacements were *2½ bearings per week.*
Solution: MOLYTONE 266 GREASE fed through a pressure system. Replacement bearings now average *only 1 every 16 weeks.*

When ordinary oils and greases fail— *MODERN ENGINEERS TURN TO*

Rocol

MOLYTONE GREASE

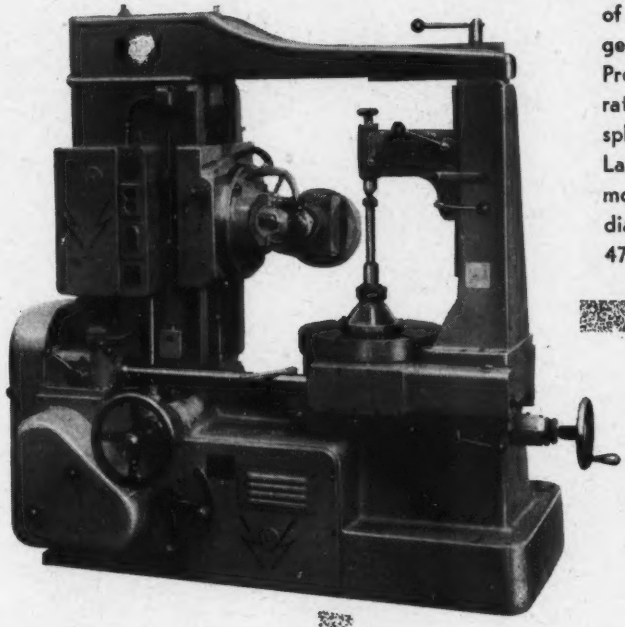
Write today for comprehensive literature on MOLYTONE GREASE and other Rocol Molybdenised Lubricants — and remember, if you have a lubrication difficulty, Rocol's expert Technical Representatives are always on call.

ROCOL LIMITED Dept. M
General Buildings, Aldwych, London W.C.2. Tel: HOLborn 1985
Rocol House, Swillington, near Leeds. Tel: Garforth 2261

7394A

MMT

1 or 10,000 off



The Almhult KF1 is designed for economic, precision hobbing of single, large or small batch gears.
Produces spurs, helicals, ratchet wheels, worms and splines.
Larger machine available, model KF2, maximum gear diameter that can be hobbed 47".

ÄLMHULT AUTOMATIC GEAR HOBBER KF1

SPECIFICATION

Max. gear diameter that can be hobbed	23½"
Min. centre distance, cutter spindle-table	1⅛"
Vertical travel of hob head slide	17 5/16"
Table diameter	19¾"
Table worm wheel indexing diameter ...	16"

✳ *ECONOMIC*
✳ *ACCURATE*
✳ *VERSATILE*

MORTIMER

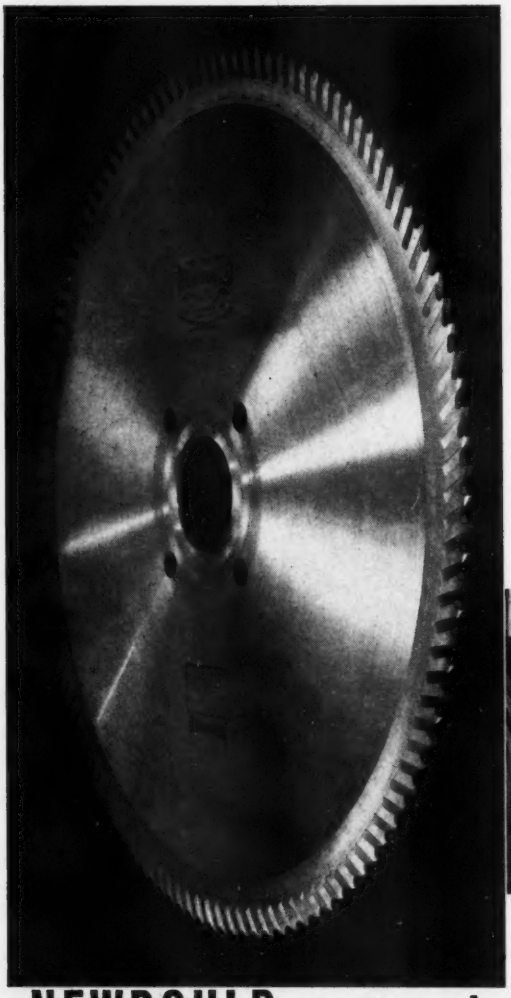
EXCLUSIVE DISTRIBUTORS OF THE FINEST MACHINE TOOLS

NRP 5155

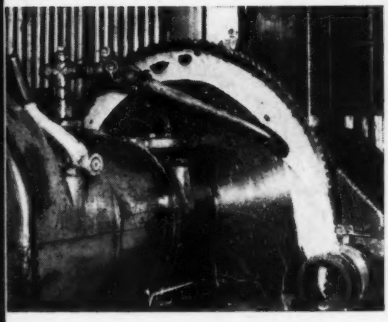
MORTIMER MACHINE TOOL CO. LTD · MORTIMER HOUSE · ACTON LANE · LONDON NW10 · Tel: ELGar 3834-5-6

When answering advertisements kindly mention MACHINERY.

Q



LONG
LIFE
ECONOMICAL
MORE
EFFECTIVE
SAWING



The NEWBOULD segmental saw

The scientific tooth design of the NEWBOULD segmental saw enables ferrous and non-ferrous metals to be cut at maximum feeds and speeds. Alternate roughing and finishing teeth produce free-curling, easily-cleared chips, reducing friction, minimising power wastage.
Made in sizes from 11" to 60" diameter with tooth segments of SABEN EXTRA high speed steel for maximum life between re-grinds.

Details on application.

SANDERSON BROTHERS AND NEWBOULD LIMITED

Attercliffe Steelworks, P.O. Box 6, Newhall Road, Sheffield 9.

When answering advertisements kindly mention MACHINERY.

Value for money?
Check these points

	3HG	4HG
✓ Horse Power	15	25
✓ Weight	4½ tons	well over 6 tons
✓ Table size	60" x 14"	72" x 17"
✓ Knee width	19"	25"
✓ Spindle bearings	5	5

- ✓ Positive backlash eliminator
- ✓ Suitable for tungsten carbide milling
- ✓ Suitable for high rake milling
- ✓ Duplicated controls and locks front and rear
- ✓ Every final drive gear bigger than the cutter it drives
- ✓ Infinitely variable feeds ¼"—64" per minute
- ✓ Hardened table screw
- ✓ Automatic slide and screw lubrication
- ✓ 24 speeds from 23 to 1250 r.p.m.
- ✓ Built-in fly wheel

A&S

With so many important features designed to get the utmost out of your cutting tools, these heavy duty, precision built milling machines offer more value for money than any other miller of comparable weight and performance. Check the vital points of the 3HG and 4HG and see for yourself.

ADCOCK & SHIPLEY LTD

P.O. Box 22, Ash Street, Leicester
Telephone: Leicester 24154
Telegrams and Cables: Adcock, Leicester

For high precision die & tool grinding

LUMSDEN MODEL 230

SURFACE GRINDERS

A wide range of dies and tools are ground to very fine limits on LUMSDEN Model 230 surface grinders at both the Wellington and Bilston works of Joseph Sankey & Sons Ltd.

These plano-type machines with their rotary table and wide variety of hand and power operated movements, incorporate a hydraulically operated saddle and shockless reversal, enabling the finest finishes to be obtained. Furthermore, fine hand movements of the head permit grinding close to a shoulder or die pin.

Standard machines are supplied with either 30" or 48" diameter tables. Larger and special table sizes to customer's requirements.

There is a complete range of Lumsden Surface Grinders from which to choose a machine ideally suited to your needs . . .

Write for full details to

Manufacturers:

LUMSDEN MACHINE CO. LTD. GATESHEAD

Sole Distributing Agents:

ALFRED HERBERT LTD., COVENTRY

* 'Penetral' treated

Cyanide Pots SAVE Money

. . . reports from a large number of our customers confirm our claim that pressed steel pots treated by our 'Penetral' Impregnation process frequently last over 1,000 hours and, under favourable conditions, 2,000 hours have been achieved.

some reasons why

1. *Pressed steel pots are homogenous and will not leak.*
2. *'Penetral' treatment resists oxidation for temperatures up to 1000°C.*
3. *Initial cost is much lower than cast pots.*
4. *Lowest cost per hour.*
5. *Supplied regularly to leading motor firms, specialist heat treatment plants, machine and small tool industries.*
6. *Standard sizes for all Cassel and G.L.C. type furnaces.*

Follsain-Wycliffe
FOUNDRIES LTD

LUTTERWORTH, Nr. RUGBY Tel: LUTTERWORTH 10, 60 or 152
617 Cogent

The Specialist Firm for HEAT-RESISTING and ABRASION-RESISTING ALLOY CASTINGS & METALS for Gas, Electricity and Steel Undertakings. Mining and Quarrying Plant Cement, Brick, Pipe & Tile Works Heat Treatment Plants.

ARMSTRONG AIRBREAKER

OLIN MATHIESON LIMITED*

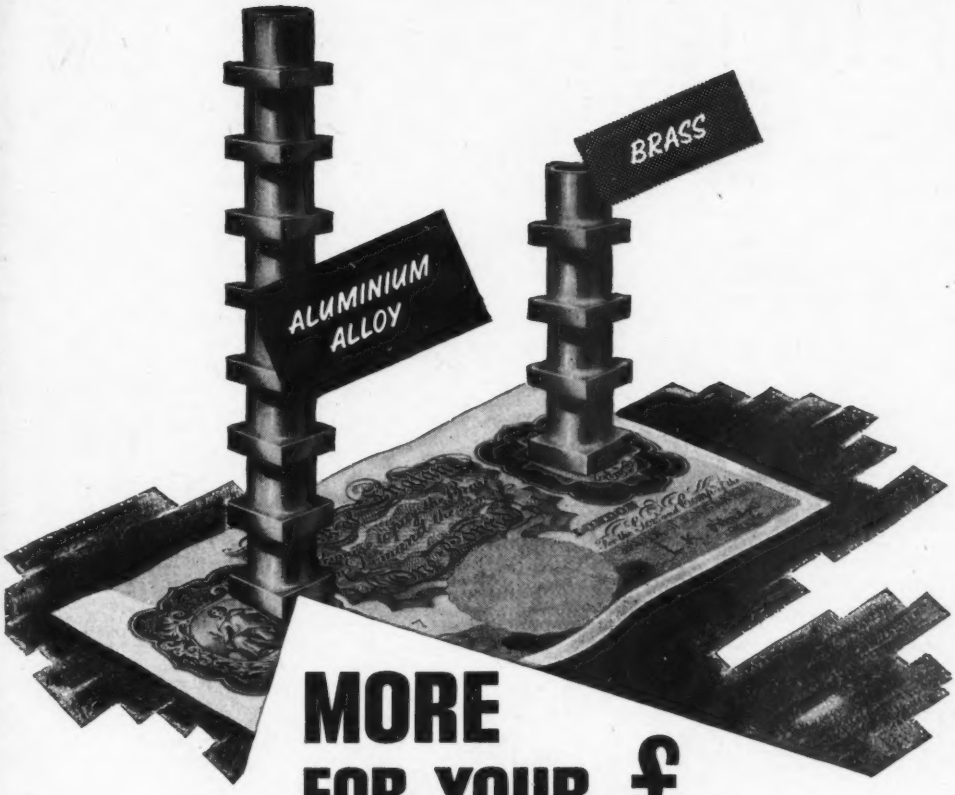
Manufacturers and Suppliers of the Armstrong Airbreaker System on Coal Mining, have available for immediate use the following services at their Perivale, Middlesex, factory.

1. Hydraulic Pressure Testing to 30,000 lbs. per sq. in.
2. Pneumatic Pressure Testing to 12,000 lbs. per sq. in.
3. Hardness Testing by either Brinell or Rockwell Systems.
4. Material analysis and certification.
5. Press Capacity.

Please address all enquiries to :

CHIEF ENGINEER,
6 WADSWORTH ROAD,
PERIVALE, GREENFORD,
MIDDLESEX.
Telephone: Alperton 2241 (7 lines)

* SUBSIDIARY OF OLIN MATHIESON CHEMICAL CORP U.S.A.



MORE FOR YOUR £

Material cost per item is less than that of other non ferrous metals.

Clean modern appearance.

Can be anodised—clear or colour.

Automatics can operate at maximum feeds and speeds.

Small chips eliminate swarf "build up" at tool tip.

Write TODAY for Full Technical Details.

Specify

ALMINAL 152

ALUMINIUM ALLOY FREE MACHINING BAR

Southern Forge LTD

MEADFIELD ROAD · LANGLEY · BUCKS

Telephone: LANGLEY 301

ALUMINIUM AND ALUMINIUM ALLOY EXTRUSIONS TUBES AND FORGINGS

When answering advertisements kindly mention MACHINERY.

SPECIALISTS

in used and reconditioned machine tools

AUTOMATICS

ACME-GRIDLEY 1¼in. Six-Spindle Bar Autos.
ACME-GRIDLEY 6¼in. RAC Six-Spindle Chucking Autos.
B.S.A. ACME-GRIDLEY ⅝in. Six, 1¼in. Six, 2¼in. Four-Spindle Autos.
B.S.A. ⅝in. Single-Spindle Automatic.
B.S.A. 9in. Single-Spindle Chucking Automatic.
POTTER & JOHNSTON 5D Chucking Automatics.
WICKMAN ⅞in. Automatic.

GRINDERS

B.S.A. No's. 7 and 8 Centreless Grinders.
CHURCHILL 'HCY' and 'HBA' Internal Grinders.
LANDIS 4 x 12 Type C Plain Grinder.
LANDIS 4 x 18 Type C Plain Grinder.
LANDIS 6 x 18 Type C Plain Grinders.
LANDIS 10 x 72 Type C Plain Grinder.
ORCUTT 20in. Spline Grinder.

DRILLERS

HERBERT, CORONA, J & S, ARCHDALE 1-2-3-4 Spindle.
POLLARD 21A Vertical Drill (Indexing Table).
BECKER Unit Head Vertical Multi-Drill.

CAPSTANS

GISHOLT 1L & 2L Capstan Lathes.
HERBERT 2D & No. 4 Capstan Lathes.

ALSO

B.S.A. 6 x 12 and 28 Multi-Tool Lathes.
B.S.A. 50H Honing Machines.
EX.CELL.O Fine Boring Machine.

The above offered subject to prior sale. All machines motorised suitable for 400-440 volts, 3 phase, 50 cycle supply.

We offer good prices for your surplus plant. Send us details—we will inspect immediately and make a firm offer. Write, wire or phone . . .

B. G. MACHINERY LTD
(B.S.A. TOOLS DIVISION)
MONTGOMERY STREET : BIRMINGHAM : 11
TEL: VICtoria 2351 TELEG: REBUILT BIRMINGHAM

BERYLLIUM COPPER IS BEST

wherever parts machined from rod or formed from wire are required to have high tensile strength, resistance to fatigue, good electrical conductivity or non-magnetic and non-corrosive properties.
The superior spring qualities of Beryllium Copper are obtained by a simple heat treatment after fabrication.

THE BEST BERYLLIUM COPPER IS

TELCON

also available as Strip, Castings and Safety Tools

Sole Distributors in the U.K.

BERYLLIUM AND COPPER ALLOYS LTD.

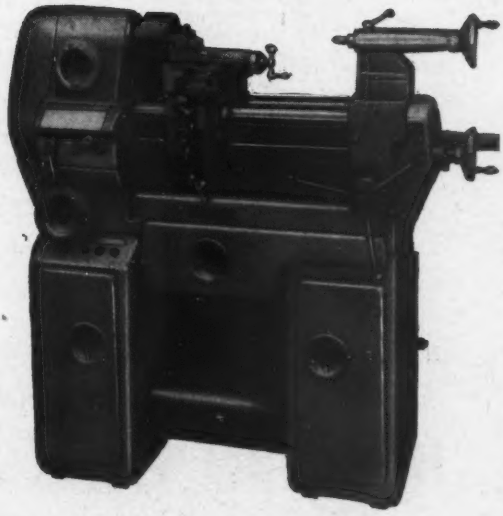
47, Victoria Street. London S.W.1. ABBEY 6421/2
15, Westfield Terrace, Sheffield 1. SHEF. 26650. 401/414, New John Street West, Birmingham 19. Aston Cross 3818.

Kneller Multi-Purpose Lathes in the Development Department of Hymatic Engineering Co. Ltd., Redditch

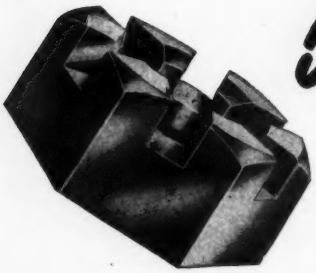
KNELLER

MULTI-PURPOSE LATHES

Although termed lathe, this versatile machine has additional characteristics such as the tailstock unit can be traversed by hand or mechanically with a range of feeds. A vertical movement to the saddle table providing characteristics of a horizontal boring machine, with thread cutting facilities. A facing slide is supplied to perform this operation. This machine is an essential for toolrooms and research departments, where pre-production and small quantities of accurate and intricate machining are required. Also being used in Technical Colleges for educational purposes.



KNELLER (Instruments & Tools) LTD., LONDON ROAD, DAVENTRY Tel: DAVENTRY 446



500 per hour slotted complete!

in mild steel

$\frac{1}{4}$" to $\frac{3}{8}$" Whit.	...	500 per hour
$\frac{7}{16}$" Whit.	...	350 per hour
$\frac{1}{2}$" Whit.	...	220 per hour
$\frac{3}{4}$" to 1" Whit.	...	110 per hour

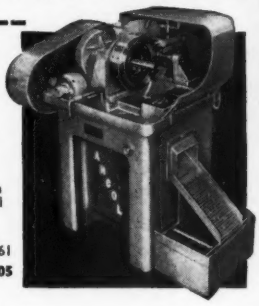
Speed up your repetition milling of slots, flats, faces, etc., and release that elaborate machine—and its skilled operator—for more complicated work. With automatic work clamping and continuous cycle the AHCOL is simple to operate and very fast.

on AHCOL

Semi-Automatic ROTARY MILLING MACHINES

	AHCOL STANDARD	AHCOL ROTAMILL
Work drum dia.	12"	12"
Cutter dia.	4"	6"
Cutter width ganged	4"	6"
Motor	1 h.p.	5, 7½ or 10 h.p.

Write for illustrated brochure M.174



DOWDING & DOLL LTD
346 KENSINGTON HIGH STREET, LONDON, W 14
Tel: WESTERN 0077 (8 lines) Telex: 23183 Grams: ACCURATOOL LONDON TELEX

7th European Machine Tool Exhibition BRUSSELS 3-12 Sept. 1961 STAND 9105 HALL 9

174

THE FASE MANUFACTURING CO. LTD

35/51 HANGER LANE, EALING, LONDON, W.5

Telephone: PERivale 4760/9825

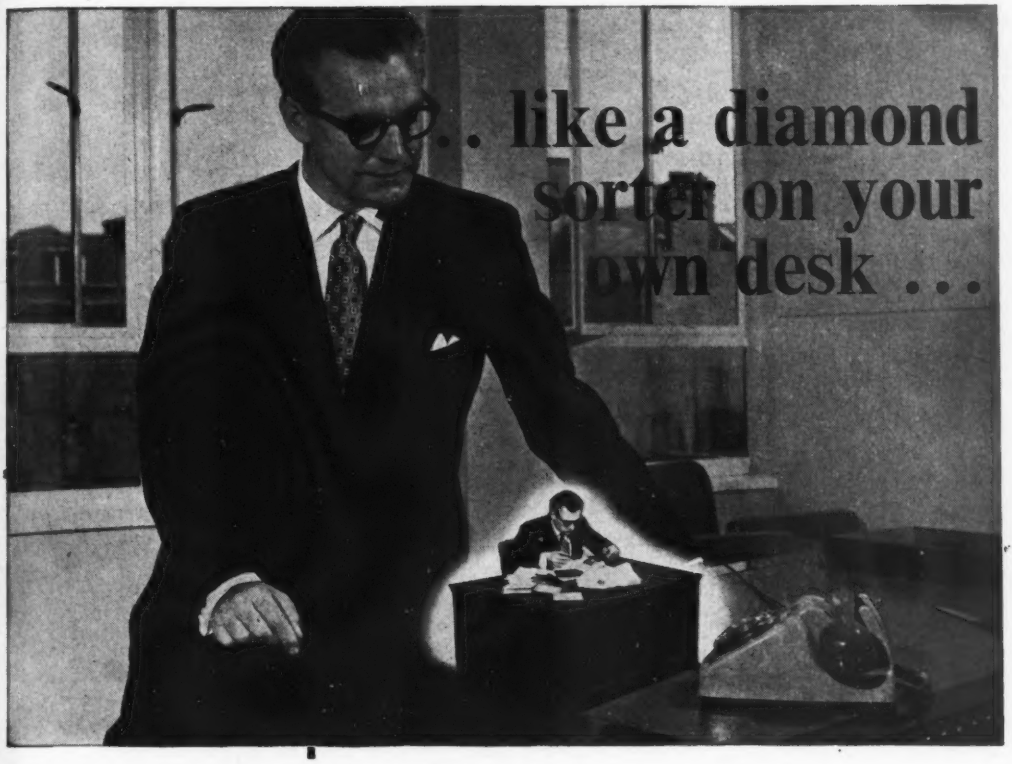
★ FOR ROD, TUBE, BAR & SHEET STORAGE
★ SHELVING, BINS, WORKSHOP TRAYS & PANS
★ WORKSHOP BENCHES & BENCH TRESTLES
★ FABRICATION OF STEEL ANGLE, FLAT & CHANNEL
★ STEEL PARTITIONING ★ SLOTTED STEEL

If you've a storage problem

FASE CAN HELP YOU SOLVE IT

IF IT'S IN STEEL – WE MAKE IT!

Send us your requirements



This Catalogue should be on your desk. It gives full details of wheel dressing and wheel forming diamond tools; diamond tools for turning, boring and hardness testing: diamond impregnated wheels and laps, in fact everything you need for selecting the right diamond tools for your operations. Send for your FREE copy now!

If *you* had your own diamond sorters working for you, you'd make quite sure that only the very best diamond was selected for *your* job. Indusmond does just that. Indusmond can work *with* you, *for* you. You can trust the expert knowledge of Indusmond—gained over a period of almost a quarter of a century—to guide you in the selection of the most economical and efficient tool for your work. You have confidence in Indusmond, it's like having a diamond tool works on your own desk.

indusmond
DIAMOND TOOLS

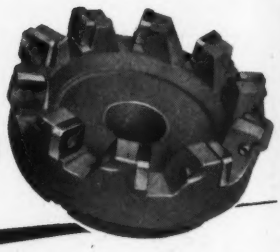
THE DIAMOND TOOL PEOPLE

INDUSMOND (DIAMOND TOOLS) LTD., 26-29 ST. CROSS STREET, HATTON GARDEN, LONDON, E.C.1

Telephone: CHAncery 7608. Northern Office: Sussex Street, Sheffield 4. Telephone: 20701 and in Birmingham, South Wales and Scotland

EDIBRAC

CENTURION



CARBIDE TIPPED TOOLS

For high cutting power, complete reliability and consistent performance EDIBRAC carbide tipped tools are unsurpassed. We carry large stocks of EDIBRAC lathe tools and tips, milling cutters, reamers, twist drills, lathe centres, etc., and are able to meet most demands immediately. Specials at short notice, too.

COMPREHENSIVE STOCKS

Sole Agents for London, Southern and Eastern Counties

GEORGE HATCH LIMITED

3 QUEENHITHE, UPPER THAMES STREET, LONDON, E.C.4
Telephone: CENtral 7751

VERSATOOL
REGD.

cabinets

For

Precision Tools

Equipment Instruments Etc.

W. PINDER & SON LTD., KING STREET, PETERBOROUGH

P2907

IF IT'S SAWING — IT'S Rapidor
REGD. TRADE MARK

THE RAPIDOR " MANCHESTER " LIGHT DUTY GEARED-MOTOR DRIVEN HACKSAW—CAPACITY 6" x 6"

Although designed for light duty this machine is strongly built and can be relied on for trouble-free sawing up to its maximum capacity. This low cost machine incorporates many of our larger hacksaws outstanding features.

THE RAPIDOR "MANCHESTER MAJOR" MEDIUM DUTY HACKSAW CAPACITY 6" x 6"

A dependable and powerful two-speed machine with built-in motor drive and pushbutton control.

Rigidly guided saw frame ensures accurate cutting, whilst other standard features make for long life and trouble-free service.

FOR HIGHEST PRODUCTION —LONGEST LIFE always use " RAPIDOR " H.S.S. BLADES

Write for full information to:

EDWARD G. HERBERT LTD.

ATLAS WORKS · LEVENSHULME · MANCHESTER 19

'Phones: RUSholme 4176 and 3829 'Grams: " Tested, Manchester "

*Automatic operation for your own capstans

with NICKOLS AUTOMATIC SEQUENCE CONTROL

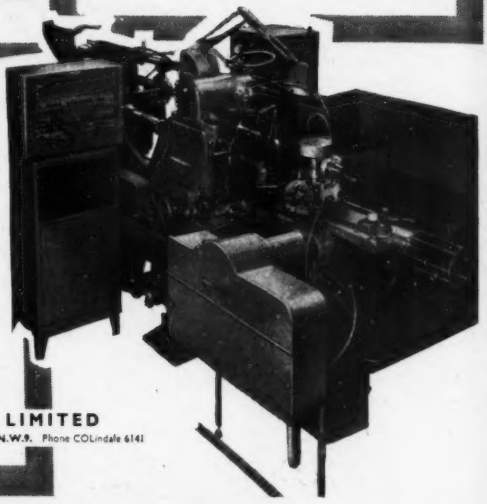
INFINITE VERSATILITY

With the NICKOLS AUTOMATIC SEQUENCE CONTROL you can retain all the advantages of the capstan lathe — simple setting, inexpensive tooling, modest capital outlay, ease of maintenance, versatility of application, etc., and supplement them with many of the more valuable features found only in automatic lathes. Rigid control of feed rates means longer life and greater accuracy from delicate form tools. Complete programme control gives maximum efficiency and consistent output — without cams or expert setting . . . and don't forget that the transformation of HERBERT and WARD capstans is accomplished in your own works in 2½ days!

- GREATER DIMENSIONAL CONSISTENCY
- EASY & RAPID SETTING
- LONGER TOOL LIFE
- ROBUST & RELIABLE

Write for details to:—

NICKOLS AUTOMATICS LIMITED
7 CARLISLE RD., LONDON, N.W.9. Phone COLindale 6141



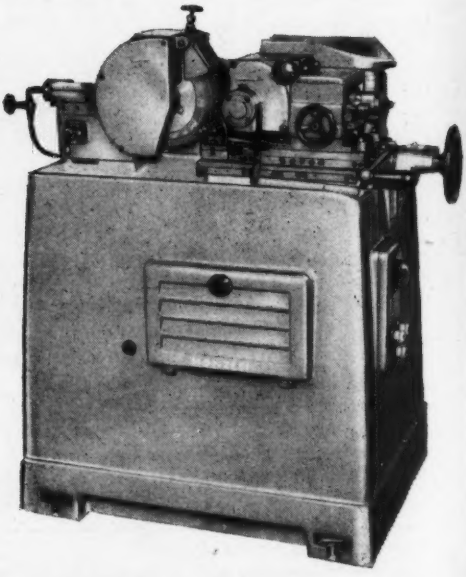
MONZESI

CENTRELESS GRINDING MACHINES

- MADE IN 4 SIZES MAX. CAPACITY 1", 2", 4" & 6"
- MODEL 250 = 1" CAP MACHINE FROM LONDON STOCK
- WIDE RANGE OF EQUIPMENT

MERCHANTS ENQUIRIES INVITED

EXCLUSIVE DISTRIBUTORS IN THE U.K.



FRYE MACHINE TOOL CO. LTD.
Poyle Road, Colnbrook, Slough, Bucks. Colnbrook 2442/3/4

AJAX AJ4 RADIAL

Photographs: courtesy of Joseph Sankey & Sons Ltd, Wellington

BRIEF SPECIFICATION

- 3" drilling capacity in steel
- 4' 6"; 5' 0"; 5' 6" arm
- Spindle No. 5 M.T.
- Rotary gear speed change
- Choice of three speed ranges
- Coolant equipment as standard

AJAX MACHINE TOOL COMPANY LTD
WESTMOUNT WORKS, HALIFAX, YORKSHIRE, ENGLAND
Telephone: 5395/9 Telegrams: Ajax, Halifax

MAINTAINS PRODUCTION AT Sankey OF WELLINGTON

This famous firm make more vehicle wheels than any other manufacturer in Europe or the commonwealth: —about 20,000 a day. The AJAX Radial in their maintenance shop is used to machine a wide variety of jobs on presses and rim rolling machines thus assisting considerably in constantly maintaining this high rate of production —another example of AJAX *versatility* and *dependability*.

POST THIS COUPON TO-DAY!
To Ajax Machine Tool Co. Ltd., Halifax
Please send me Brochure of Ajax Machines

NAME .....
POSITION .....
FIRM .....
ADDRESS .....

Optical Dividing Head

COMBINING THE FOLLOWING FEATURES —

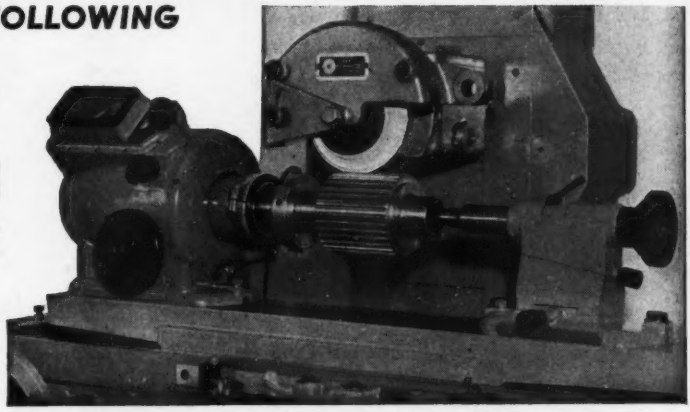
IT IS LIGHT (42lb.)

ACCURATE
(6 secs. reading)
(3 secs. estimate)

BUILT TO NPL SPEC.
No. MOY/SCM/56

ADAPTABLE TO
Grinding Machines
Jig Borers
Jig Grinders
Milling Machines
Inspection Tables

FULL DETAILS



PRECISION GRINDING LTD
MILL GREEN ROAD : MITCHAM : SURREY *MITCHAM 3014*
NRP 5226

For RAPID, PRECISE REPETITION *Boring*

FRENCH DE VALLIÈRE

DOUBLE ENDED PRECISION FINE BORER AL.4

For repetition fine boring. Automatic cycle. Double-ended boring heads permit boring from both ends on the same or parallel axes. Simple to set. Rapid traverse. Single or double-ended machines with one, two or four boring heads available.

Boring capacity 4½". Spindle speeds 300 to 5000 r.p.m. Feeds (40) ¾" to 11" per. min. Table traverse 19". Table size 16½" x 10"

DOWDING & DOLL LTD
346 KENSINGTON HIGH STREET, LONDON, W.14
Tel: WESTERN 6077 (8 lines) Telex: 23182 Grams: ACCURATOOL LONDON TELEX

236

See this machine at our Showrooms and ask for brochure M/236

OVER 100 YEARS OF 'KNOW-HOW' IS BUILT INTO THIS

GRAFFENSTADEN

SOCIÉTÉ ALSACIENNE DE CONSTRUCTIONS MECANIQUES

HORIZONTAL FLOORTYPE MILLING AND BORING MACHINE with OCTAGONAL RAM

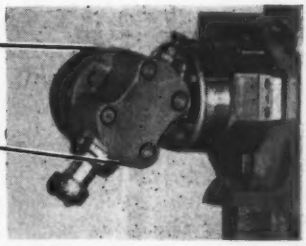
Stroke of ram, 49in.

Diameter of boring spindle, 6.3in.

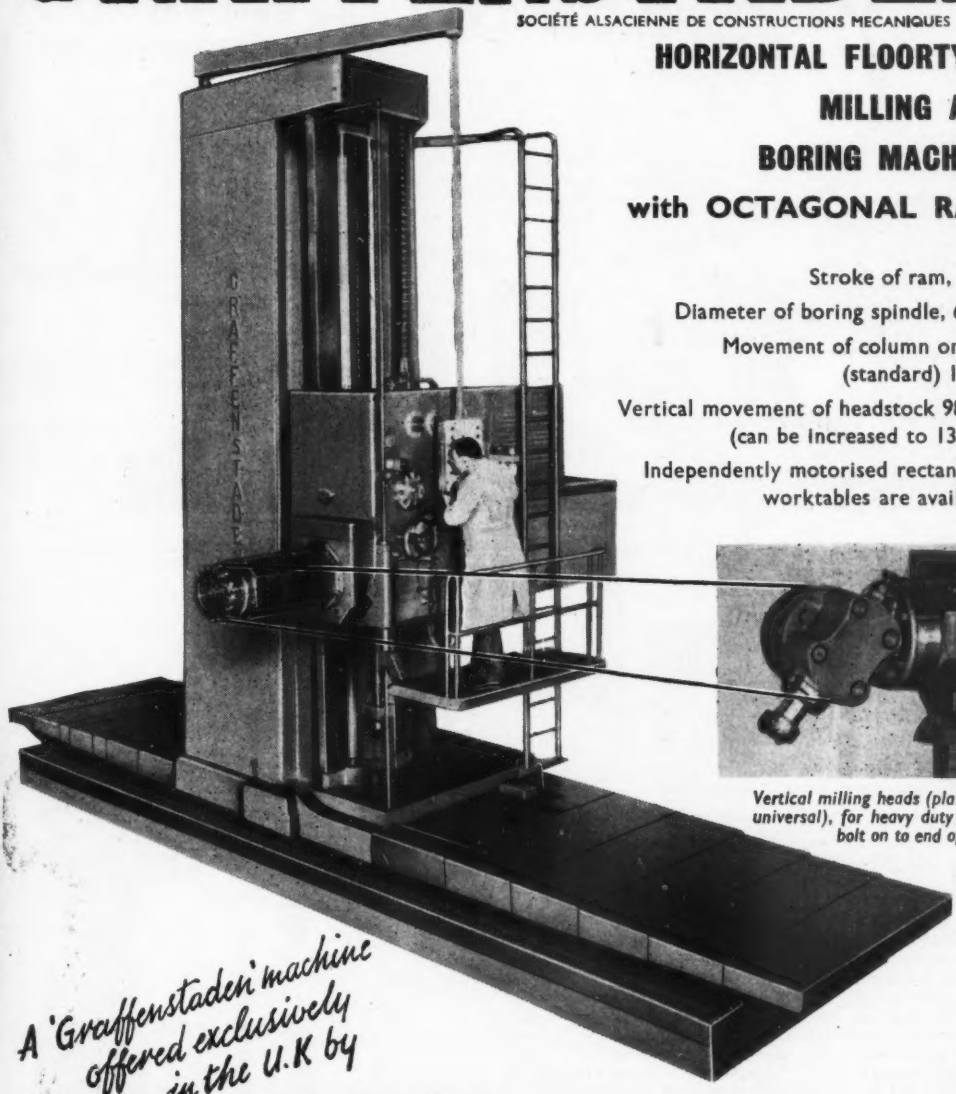
Movement of column on bed (standard) 158in.

Vertical movement of headstock 98.5in. (can be increased to 130in.).

Independently motorised rectangular worktables are available.



Vertical milling heads (plain and universal), for heavy duty work, bolt on to end of ram.



A 'Graffenstaden' machine offered exclusively in the U.K by

ACBARS

ACBARS LIMITED
331-3 WALWORTH RD., LONDON, S.E.17
Telephone: RODney 7822 *Telegrams: Acfirb London, S.E.17*

Well done, Will!

SIFBRONZE it—that's the best way

Success follows success with Sifbronze. And it's all because of its unique formula which has all the advantages of low heat in-put combined with great strength, a strength that has a stress of 23.52 tons per square inch. It will be WELL DONE every time if you stick to Sifbronze. Sifbronze gives you a safe machinable weld quickly and at lower heat, thus reducing to a minimum the risks of distortion, stress and cracking. There is nothing quite as good as Sifbronze—or as low in cost. *Write NOW for full details to Will-the-Welder,*
SUFFOLK IRON FOUNDRY (1920) LTD., SIFBRONZE WORKS,
STOWMARKET, ENGLAND. ('phone Stowmarket 183)

TIB 113

ARBOGA
Drilling Machines

for Operational Ease!

Arboga drilling machines are available as bench, pillar or radials in capacities from ⅜in. to 2in.
A comprehensive range of equipment is available for both Tool-room and production-shop use. Illustrated is model E 210, ⅜in. capacity. Incorporates motor of special design giving practically constant torque at all speeds.

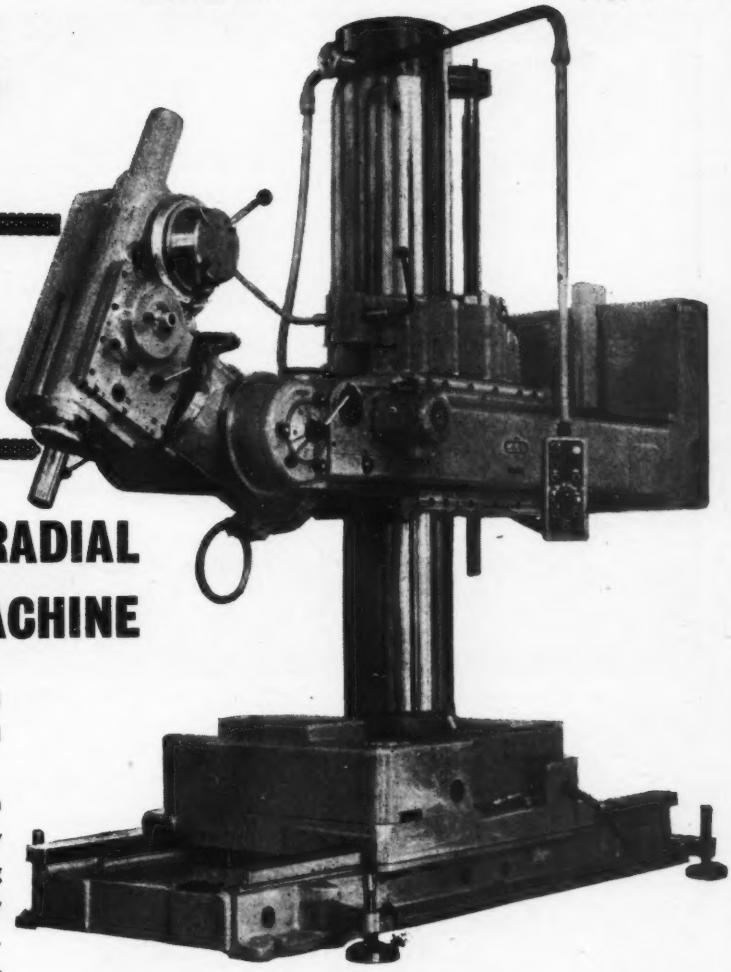
ALL ARBOGA PRODUCTS ARE SOLD THROUGH THE FOLLOWING DISTRIBUTORS:

A. Douglas Co. Ltd.	High Wycombe	High Wycombe 4390
Mitchells Oldfield Ltd.	Glasgow	SCOtstoun 5180
Monks & Crane Ltd.	London	HAMpstead 9624
Monks & Crane Ltd.	Birmingham	STEchford 4051
Joseph Pugsley & Sons Ltd.	Bristol	Bristol 56037
J. & H. Smith Ltd.	Leeds	Leeds 21561
Victa Engineering Co.	Poole, Dorset	Lychett Minster 578

KAVANAGH O'MOORE & Co., LTD.
1a, ALDRED ROAD·WEST HAMPSTEAD·LONDON·N.W.6
Telephone: HAMpstead 6548 Telegrams: "Toledoro Cent London"

MAS

VRM 50A



UNIVERSAL RADIAL DRILLING MACHINE

For drilling, reaming and thread cutting large and bulky workpieces.
Ideal for heavy duty work in Production and Assembly shops such as bridge building boiler construction, railway and shipbuilding yards.
All movements are easily controlled by push-buttons on a pendant arm.

- Drilling Capacity 2in.
- Spindle Speeds (15) 16-800 r.p.m.
- Drilling Motor 5 h.p.
- Arm swivels through 360°.

IMMEDIATE DELIVERY

THE BIG MACHINE FOR THE BIG JOB!

ELGAR

EXCLUSIVE DISTRIBUTORS IN THE UNITED KINGDOM

MACHINE TOOL COMPANY LIMITED

172-178, VICTORIA ROAD · ACTON · LONDON W3 · Telephone: ACORN 5555
MIDLANDS SHOWROOM: 1075 KINGSBURY ROAD, ERDINGTON, BIRMINGHAM 24 · Tel.: Castle Bromwich 3781/2
SOLE SCOTTISH AGENTS: ANGUS & CRICHTON (SALES) LTD., 7, MIDLAND STREET, GLASGOW C.1. · TELEPHONE: CITY 4560

NRP 3205

PRESSED STEEL

sections : trench sheeting : road forms

troughing : dovetail sheeting : gutters

PALLETS and *STILLAGES*

PRESS BRAKE WORK OF ALL DESCRIPTIONS

including holing and welding as required.

DORMAN LONG (*Steel*) LTD. AYRTON ROLLING MILLS, MIDDLESBROUGH

London Office: Terminal House, 52 Grosvenor Gardens, S.W.1. Telephone: SLOane 2275

DORMAN LONG

CUT YOUR SAWING COSTS

SPEED

CORPORATE MARK SPEED

METAL CUTTING **BAND SAWS**

HARD TEETH - FLEXIBLE BACK

Unsurpassed for fast cutting and long life

Perfect tooth contours, controlled straight line depth of hardness, uniformity of temper ensure all "Speed" users fast, accurate, economical sawing for every job whether on ferrous or non-ferrous metals, plastics or laminated timbers.
Nimonics and Stainless Steel castings can be cut at friction speeds.
Supplied in widths from ¼in. to 1in. with raker or skip teeth.
Our technical representatives are at your service. Consult us on any cutting problem.

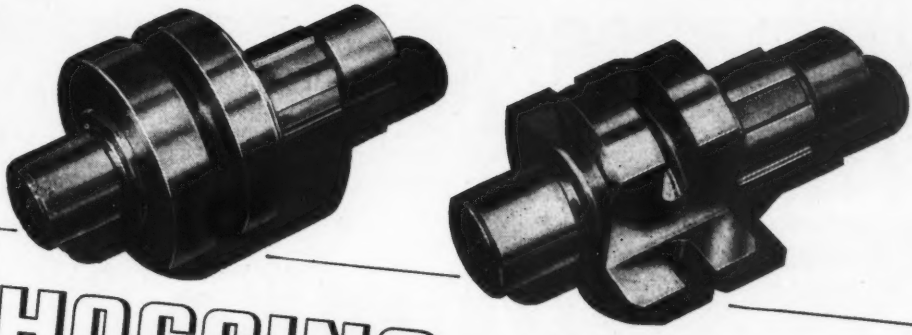
Also:
"Super-Speed" High Speed Steel Hacksaw Blades.
"Speed" Tungsten Alloy Steel.
"Super-Speed" Hacksaw Frames.
"Super-Speed" HSS Slitting Saws.
"Super-Speed" HSS Slotting cutters etc., etc.

SLACK, SELLARS & CO. LTD

HOWBRAY STREET · SHEFFIELD 3 · ENGLAND

THE METAL SAWING SPECIALISTS

When answering advertisements kindly mention MACHINERY.

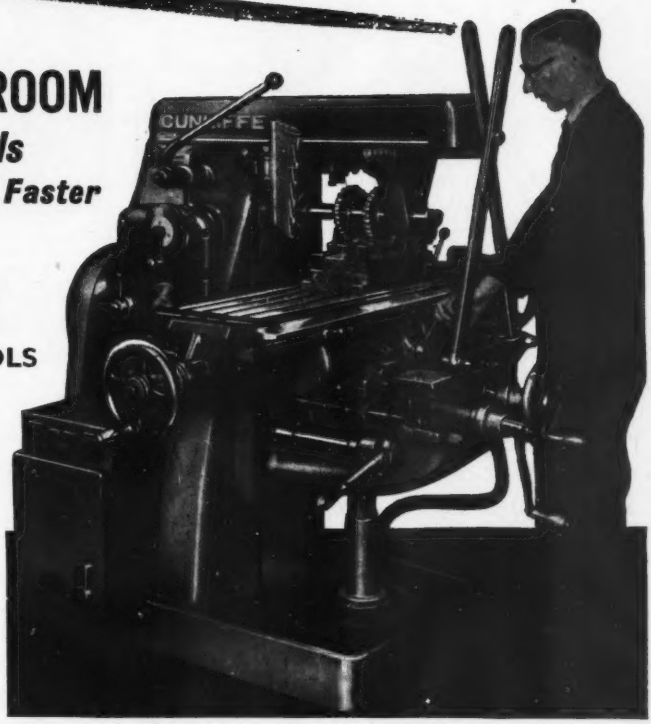


HOGGING - or Finishing...

CUNLIFFE & CROOM
Horizontals
Do the job Better and Faster

- AMPLE POWER
- WIDE SPEED & FEED RANGE
- SIMPLIFIED CONTROLS

In the well-equipped works of Herbert Morris Ltd. Loughborough, this CUNLIFFE & CROOM horizontal shows to advantage on the milling of wheel shafts.
These machines, with their massive rigidity and ample power, are capable of real 'hogging' or carrying out light finishing with the utmost precision.
We will glady tell you the full story. Please write for catalogues.



CUNLIFFE & CROOM LTD.

STANLEY SG GROUP

BROUGHTON WORKS, MANCHESTER 7. Tel : Blackfriars 1805/6

Sole Agents: ALFRED HERBERT LTD. COVENTRY Tel. 89221

THE NEW 'ACE' PNEUMATIC DRILL ATTACHMENT

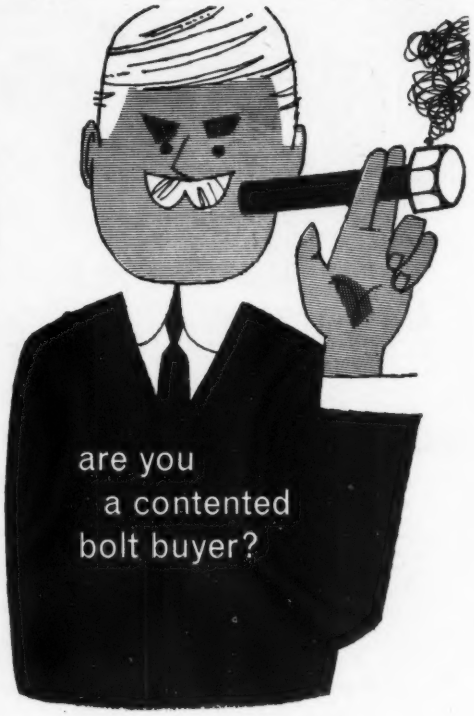
Efficient— Light— Inexpensive

Made in Australia, this sturdy drill attachment, **which makes your Drill Press Automatic,** has a wide range of feed, fast or slow return, and can be used in any position and on any work where automatic movement is required. Converts easily from automatic to hand or foot control. Fits the most sensitive drilling machines, and has many other uses in addition to drilling.

For full particulars write or telephone: Sole European Concessionaires

FRANK LEWIS & CO (LONDON) LTD

HEAD OFFICE
65, ST. PAUL'S CHURCHYARD,
LONDON, E.C.4
TELEPHONE: CITY 1027



There's no mistaking a member of the Institute of Contented Bolt Buyers—head held high, smugly smiling, he has this business all sewn up. It began when he discovered that Lanarkshire Bolt have a big range embracing black, bright, stainless steel and high-tensile, too. Now with one source of supply for most of his needs, life is easy. No need to chase bolts when he can trace them in the Monthly Stocklist which Lanarkshire send him, showing what materials, which sizes and how many they have available ex-stock.

Enrol as a member of the Institute of Contented Bolt Buyers by asking Lanarkshire to post you their Stocklist every month

LANARKSHIRE
BOLT LIMITED

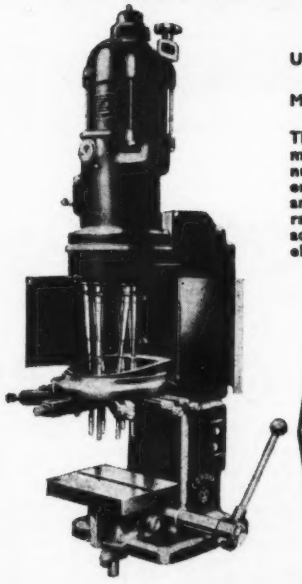
HAMILTON, LANARKSHIRE, SCOTLAND
Tel: Hamilton 1241-5

14/2/61

CUT your drilling costs

CORONA

Adjustable Spindle MULTIPLES

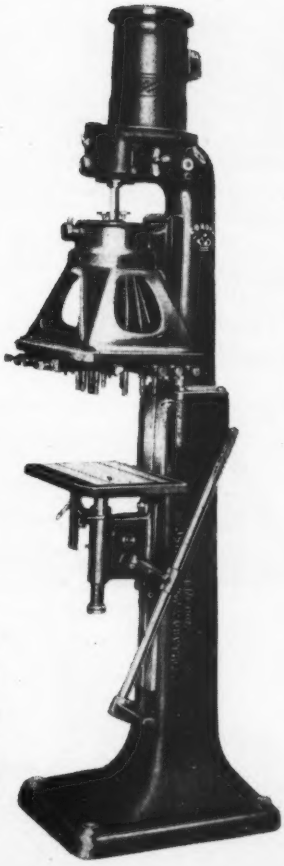


TYPE 12 MX
UP TO 12 SPINDLES IN AN AREA OF 12in. — 8in.
MAXIMUM DRILLING CAPACITY ⅜in.

These machines keep costs low on multiple repetition drilling. Any number of spindles up to 12 can be employed and adjustment is rapid and simple. Feed is by lever and rack-operated table with a vertical adjustment of 20in. Available with electrical reverse.

TYPE 6 MX
BENCH OR PEDESTAL
UP TO 10 SPINDLES IN AN AREA OF 5in. DIA.
MAXIMUM DRILLING CAPACITY 0.196in.

Available with or without electrical reverse, these machines will drill and tap small components at very fast rates. Tee-slotted table has lever feed. Head has 6in. vertical adjustment. Two speed ranges through gear box. Maximum speed 3,000 r.p.m.

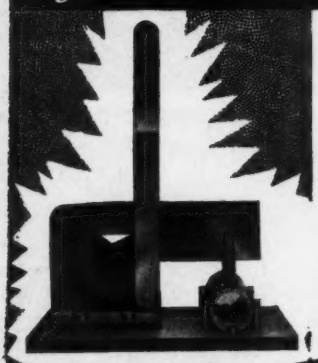


FREDK POLLARD & CO LTD

CORONA WORKS, LEICESTER, ENGLAND. · TEL: LEICESTER 67534 (5 lines)

London Office: COASTAL CHAMBERS, 15 ELIZABETH ST., BUCKINGHAM PALACE RD., S.W.1. TEL: SLOANE 8080
Scottish Representatives: WALTER S. LANG & CO., 48 OSWALD STREET, GLASGOW, C.1. TEL: CENTRAL 2539
North East: HODSON MACHINE TOOLS LTD., 150 NEW BRIDGE STREET, NEWCASTLE-UPON-TYNE

Effective Two-Way Clamping in One Operation

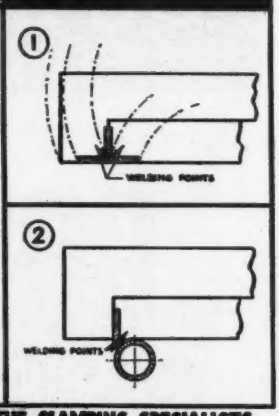


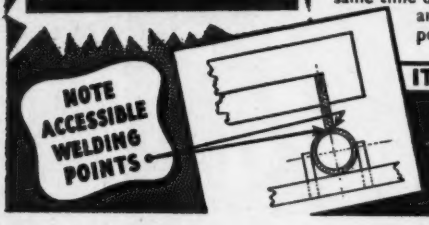
Speetog Welding Clamp

SOLVES AN OLD PROBLEM

The Speetog Welding Clamp, for the first time, makes it possible, not only to locate two components in relationship to each other, but also to clamp them both vertically and laterally in one movement. It is particularly suitable for assembly fixtures where ear plates, gusset plates and other similar components are to be welded to a main frame. As the illustrations here show, the components are securely located both laterally and vertically and at the same time during clamping, the welding points are retained in the most accessible position for the welding operator.

Patent No. 660301





IT WILL PAY YOU TO CONSULT THE CLAMPING SPECIALISTS

Speed Tools Ltd

VEREKER BUILDINGS, GRESSE ST., LONDON W.1. MUSEUM 1099/1099

FULL LITERATURE ON REQUEST

NRP 9071

"Duplex" *Direct Drive*

TOOL POST GRINDERS

Here are two additions to the range of Duplex Tool Post Grinders. They are, in effect, precision grinding spindles with carefully balanced 3 phase rotors mounted thereon. Super precision bearings are used throughout. These units can be used in any position from the horizontal to the vertical for plain, form and cup grinding on lathes, shapers, planers and other machine tools. They are the answer to many an awkward production problem.

Two sizes are made,

D.50	7in. by ⅜in.	0.5 H.P.
D.60	14in. by 1¼in.	3 H.P.

3 phase only, any voltage.

Send to-day for our complete Catalogue of Tool Post Grinders.

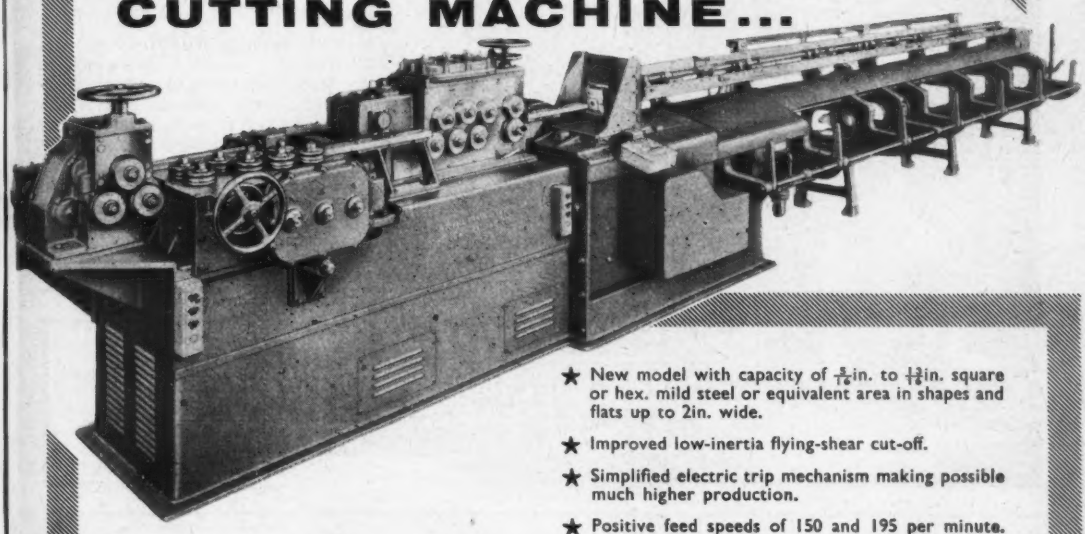
DUPLEX ELECTRIC TOOLS LTD.,

WOBURN WORKS, PURLEY, SURREY

***Telephones:* UPLands 3731-8621.**

the LEWIS No 21-FHA

SHAPE STRAIGHTENING & CUTTING MACHINE...



★ New model with capacity of $\frac{5}{16}$in. to $\frac{13}{16}$in. square or hex. mild steel or equivalent area in shapes and flats up to 2in. wide.

★ Improved low-inertia flying-shear cut-off.

★ Simplified electric trip mechanism making possible much higher production.

★ Positive feed speeds of 150 and 195 per minute.

...for higher production

The Lewis Machine Co. has added another new model for shapes to their line of wire straightening and cutting machines. Designed to take stock from the coil, straighten and cut automatically to accurate predetermined length.

Flying Shear Cut-off travels with rod and cuts while in motion—eliminates feed roll marks.

★ *Write for more information on this machine.*

✳ there are over 50 models in the LEWIS range

GASTON E. MARBAIX LTD.

DEVONSHIRE HOUSE, VICARAGE CRESCENT, BATTERSEA, S.W.11. Phone: Battersea 8888 (8 lines)

MULTIPLE DRILL HEADS

★ COMPACT IN DESIGN
★ FIXED OR ADJUSTABLE CENTRE DISTANCES

Hey Multiple Spindle Drill Heads convert Standard Drilling and Boring Machines to High Production Machines permitting drilling of all holes in a component simultaneously, with production rates equal to those obtainable on expensive special purpose machines.

Compact design reduces to a minimum, distance from drill head to machine spindle, whilst careful selection of material ensures an extremely efficient light weight head.

Heads are available with any number of spindles, covering a wide range of sizes

MAXIMUM PRODUCTION ON DRILLING, REAMING, TAPPING AND SPOT FACING OPERATIONS

HEY ENGINEERING CO. LTD.
COVENTRY PHONE: COVENTRY 88641

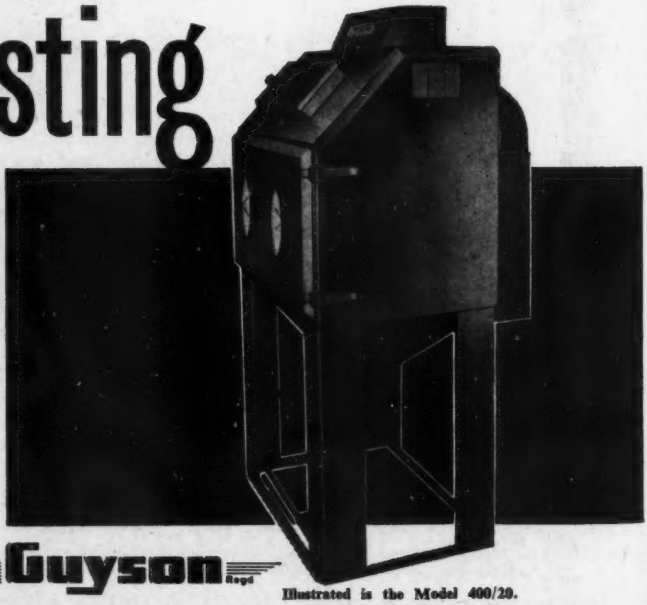
We also manufacture Rotary Cam and Profile Milling Machines, Short Thread Milling Machines, Gear Tooth Rounding Machines, Tapping Machines, End Facing and Centring Machines, Special Machine Tools for High Production.

Shot Blasting

where you want it- when you want it

The Guyson range of Light Industrial Shotblast Cabinets covers all phases of Light Industrial Shotblast requirements in Toolroom, Production Bay, Laboratory or Repair Depot. These virtually self-contained units can be easily moved to any part of the production line to Clean, De-scale, Matt-finish or Metal Sheen components in Metal, Glass, Plastics, Ceramics, etc., saving valuable time.

Why not send for Bulletin 400/20 (B) today and learn how Guyson Equipment can help *your* production.

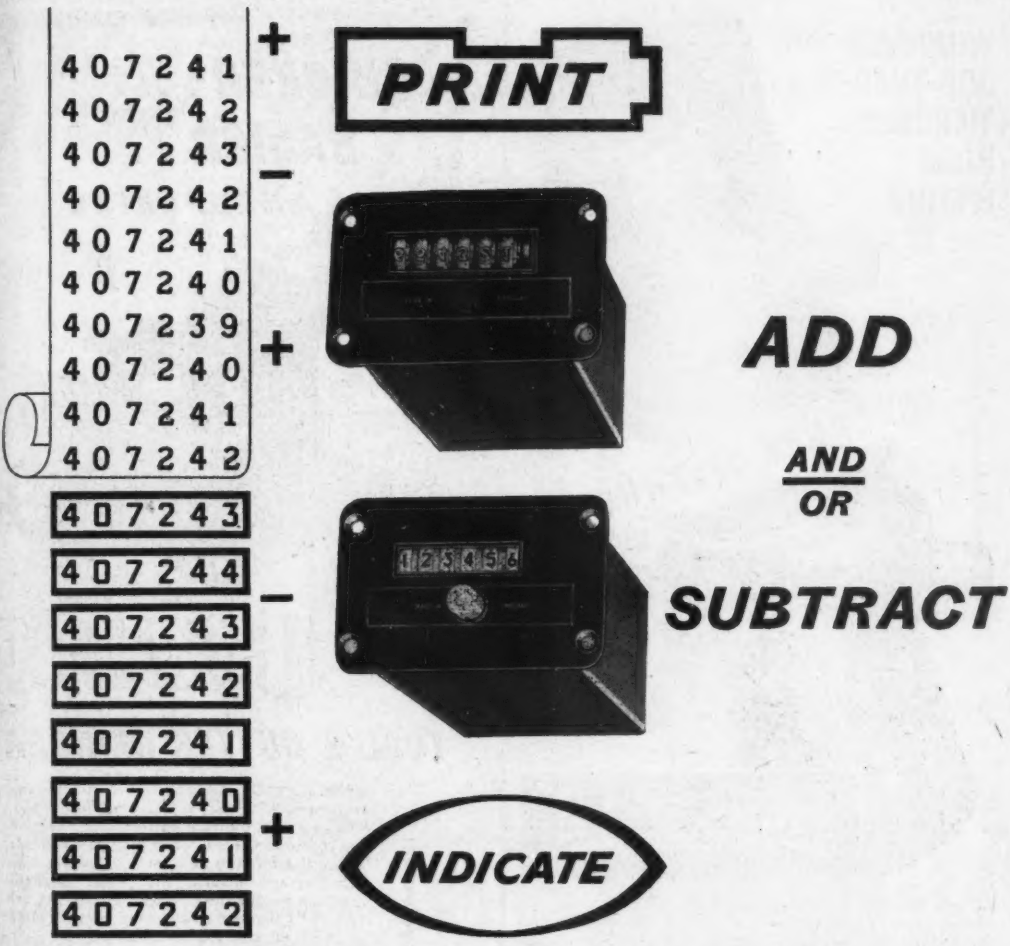


Guyson Regd

Illustrated is the Model 400/20.

GUYSON INDUSTRIAL EQUIPMENT LTD.

North Avenue, Otley, Yorks. Tel: Otley 2456. Grams: "Guyson Otley"



A NEW SERIES OF ELECTRICAL IMPULSE INDICATING OR PRINTING COUNTERS

Optional Features Include—*Add only, Subtract only or Add and Subtract Models—Operation on AC or DC—Electrical or Manual (push button) reset—Standard and High Speed Models with counting rates up to 3000 impulses per minute—Service life in excess 10^8 impulses—*

For full details of this new series of Counters write to:—

ENGLISH NUMBERING MACHINES LTD.

Queensway · Enfield · Middlesex

Howard 2611 PBX Cables—Numgravco · Enfield

Leading Manufacturers of Counting and Numbering Devices

WHATEVER THE JOB-THERE'S A 'HERCULES' HOSE FITTING

...TO CARRY IT THROUGH

Fittings for repairing burst or leaking hose; for joining two or more lengths of hose; for connecting hose to tool, compressor, etc.—whatever the job, there's a' HERCULES ' Hose Fitting to carry it through with efficiency, economy and safety.

'HERCULES' LUG-T PE COUPLINGS *(illus.)*

For suction and delivery hose. Buttressed-lugs for extra strength. Machined and polished all over. Specially selected rubber washers. In brass, gun-metal or stainless steel.

THE 'HERCULES' RANGE INCLUDES:

Hose Repairers, Screw Couplings, Adpators, Hose Grips, Flexible Steel Band Hose Clips, etc., for pneumatic, oxy-acetylene and ALL TYPE OF INDUSTRIAL HOSE.

No clips, clamps or special tools needed to fix the famous ' Hercules ' Claw Gsips. YOU SIMPLY HAMMER THE CLAWS HOME!

Let us send you full details and prices

NEWTON SALES COMPANY LTD.

(Hose Division), 517-523 Fulham Road, London, S.W.6.

Tel: FULham 4228

THE SPECIALISTS IN HOSE FITTINGS

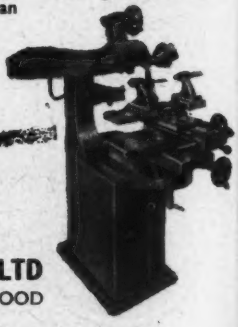
QUICKER.. EASIER.. TOOL SHARPENING

David **Dowling**

TOOL & CUTTER GRINDERS

BENCH MODEL (*As above*). An outstanding feature is the 180° rotation of workhead, allowing side and face cutters to be ground on periphery and both sides without removal from the centres. Vibration-free construction enables the finest possible finish to be obtained. Capacity 9in. dia. by 13in. Universal workhead and radius grinding attachment available.

FLOOR MODEL. This machine, with its unique combination of horizontal, vertical and angular movements so simplifies the grinding of form and die-sinking cutters that accurate results can be obtained quickly and easily. Capacity: 10in. dia. by 14½in.



Stocked by
Buck & Hickman Ltd.
Thos. P. Headland Ltd.
Robt. Kelly & Sons Ltd.

DAVID DOWLING LTD

BATES ROAD · HAROLD WOOD
ROMFORD · ESSEX
Telephone: Ingrebourne 43904/5

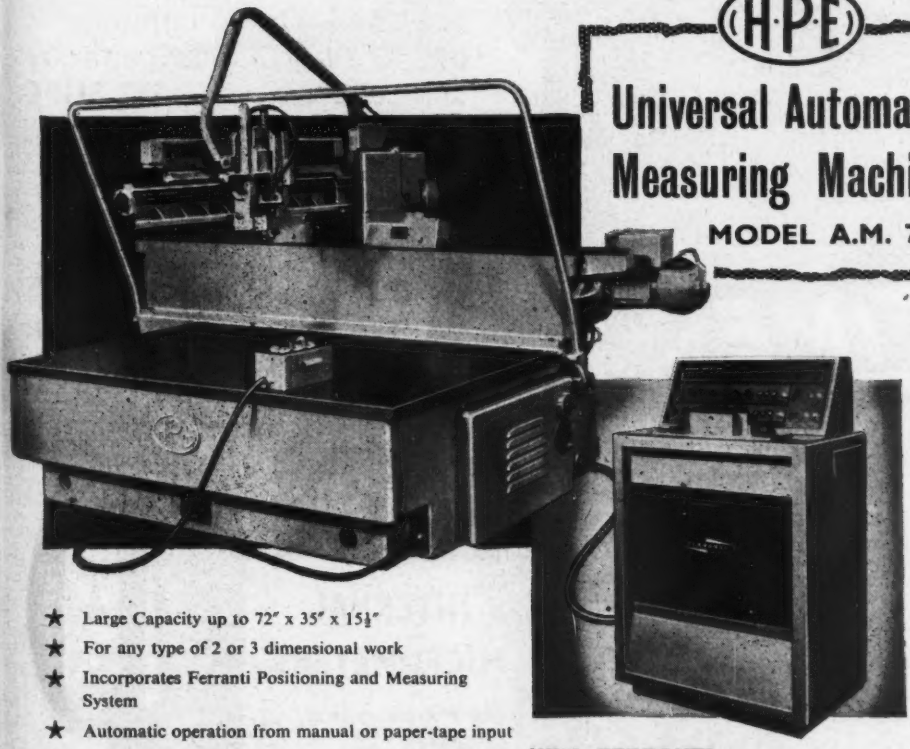
New Equipment

for UNIVERSAL MEASUREMENT!

(H·P·E)

Universal Automatic Measuring Machine

MODEL A.M. 7236



- ★ Large Capacity up to 72″ x 35″ x 15½″
- ★ For any type of 2 or 3 dimensional work
- ★ Incorporates Ferranti Positioning and Measuring System
- ★ Automatic operation from manual or paper-tape input
- ★ Visual and continuous three axes display of position
- ★ Facilities for output signals to operate print-out or other recording equipment
- ★ Accuracy of reading ·00025″
- ★ Open sided construction for handling large size components

With FERRANTI Numerical Positioning Control Equipment

See Demonstrations on this machine
FERRANTI STAND 9214 (HALL 9)
7th European Machine Tool Exhibition
Brussels.

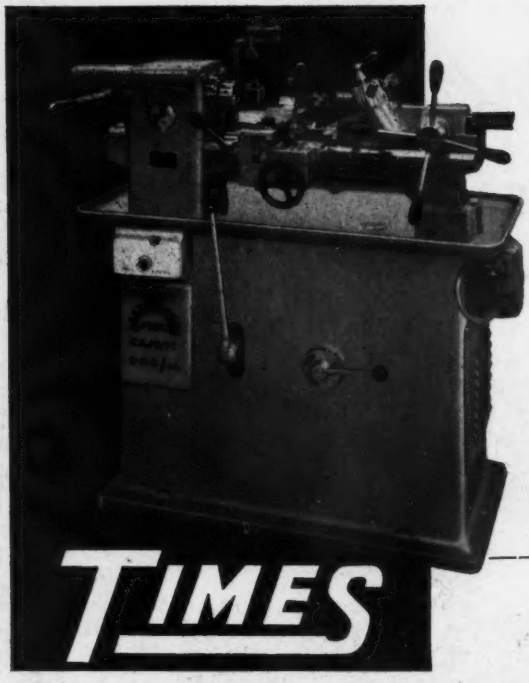
Fully illustrated details on request

(H·P·E)

HIGH PRECISION EQUIPMENT LIMITED
BLETCHLEY · BUCKS
Telephone: BLETCHLEY 3403/4/5

Æ
An Associated Engineering Limited Company

When answering advertisements kindly mention MACHINERY.



S.A.I.C

PRECISION CAPSTAN LATHES

DP4/26—1" Collet capacity
DP6/32 TV—1¼" Collet capacity
with **VERTICAL CUT-OFF SLIDE**
Complete with tool holders, bar feed and collets

EX STOCK

EXCLUSIVE DISTRIBUTORS IN THE U.K.

THE TIMES MACHINERY CO. LTD.
Poyle Road, Colnbrook, Slough, Bucks.
Telephone: Colnbrook 2442/3/4

SLEEPER ON/OFF PUSH BUTTONS

put safe control at the operator's finger tips.

The unique **Sleeper ON/OFF Push Button** provides positive **ON/OFF** control at the working plane—**safely—conveniently.**

Other **SLEEPER** products include:

- **FLOAT SWITCHES**
- **LIMIT SWITCHES**

C. E. SLEEPER LTD · MINEHEAD · SOMERSET
Telephone: Minehead 873

BOWERS

INTERNAL MICROMETERS

The Precise Answer to Your Measuring Problems

FOURTEEN STANDARD SIZES	
½" to ⅝"	13 mm. to 16 mm.
⅝" to ¾"	16 mm. to 19 mm.
¾" to 1"	19 mm. to 25 mm.
1" to 1½"	25 mm. to 37 mm.
1½" to 2"	37 mm. to 51 mm.
2" to 3"	51 mm. to 77 mm.
3" to 4"	77 mm. to 103 mm.

Write for leaflet

BOWERS INTERNAL GAUGE COMPANY LTD. Pioneer Works Thornbury St. BRADFORD. Phone: Bradford 64258-9

BUHLER

800 TON DIECASTER

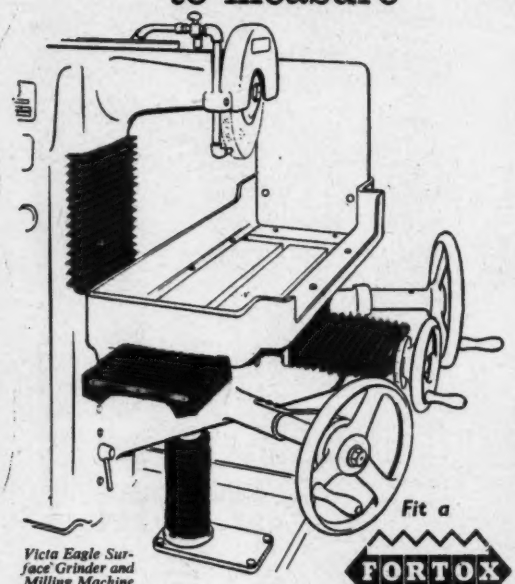
90 Tons Injection Force
30in. Opening Stroke
5ft. by 5ft. Platens
10 Seconds free cycling

London Sales Office: THE WOOD HOUSE, COCKFOSTERS, BARNET, HERTS.

BUHLER BROTHERS

UZWIL/SWITZERLAND

Protection - made to measure



Victa Eagle Surface Grinder and Milling Machine fitted with Fortox Neoprene Nylon Corrugated Covers.

Fit a FORTOX Cover

Fortox Flexible Covers are designed and manufactured specifically to fit any part of a machine requiring protection. Single items can be supplied promptly, usually without tool charge. Made in neoprene nylon, proofed leather or coated fabrics, according to conditions, Fortox Covers exclude dirt from sliding members, cutting down wear, reducing maintenance and lengthening the life of a machine. Write now for our technical book 'Corrugated Covers for Machine Tool Protection'. British Agents for Gebr. Hennig oHG Munich.
Manufacturers of covers for all continental machine tools. Replacements obtainable direct. Telescopic metal screens, metal blinds and flexible steel aprons supplied. Ask also about Fortox seals and packings.

FORTOX seals and packings

FORTOX flexible covers

HENRY BEAKBANE (FORTOX) LTD.
Head Office: OLDINGTON TRADING ESTATE, KIDDERMINSTER, WORCS.
Tel. Kidderminster 5061
Grams. Beakbane Kidderminster
London Office: 28-30 LITTLE RUSSELL STREET, LONDON, W.C.1. Tel. Holborn 7295
Grams: Beakbane, Westcent, London.

HERMETITE

The World's widest range of
JOINTING COMPOUNDS
is made by
KENILWORTH
pioneers and specialists in this field
HERMETITE
seals pressure tight!
For further information contact
THE KENILWORTH MFG. CO. LTD.
West Drayton · Middlesex
West Drayton 3731

TOOLING SERVICE

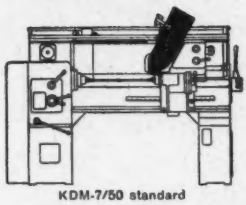
★

Designers & Manufacturers of
JIGS · FIXTURES
PRESS TOOLS
GAUGES · MOULDS
and
SPECIAL PURPOSE MACHINES

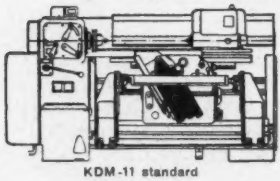
★

RATCLIFFE TOOL Co. Ltd
GORST ROAD, LONDON, N.W.10.
Telephone: ELGar 6693
and at
COED COCH ROAD, OLD COLWYN, N. WALES
Telephone: COLWYN BAY 55288
A.I.D. Approved A.R.B. Approved

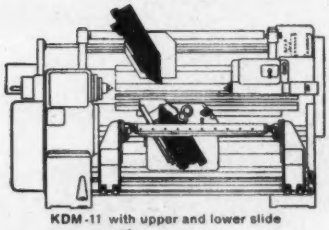
+GF+



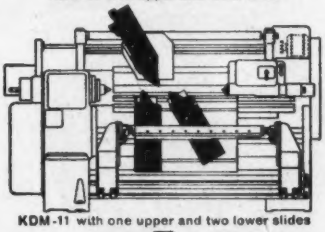
KDM-7/50 standard



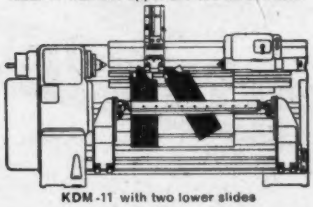
KDM-11 standard



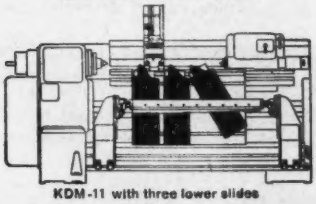
KDM-11 with upper and lower slide



KDM-11 with one upper and two lower slides



KDM-11 with two lower slides



KDM-11 with three lower slides

Copying Lathes

4 New Ways 3 Times Faster

resulting from the combination of the +GF+ Copying Lathes KDM-7 and KDM-11

- 4 new models
- greatly reduced production times owing to multiplied single-tool copy-turning
- independent upper and lower slides
- internal and external copying in both directions
- multiplex lower carriage:
  one feed carriage;
  copying slides operating separately in the vertical or at a slant;
  one copying template for each slide;
  overlapping turning lengths.

VAUGHAN
ASSOCIATES LIMITED
VAUGHAN HOUSE, 4 QUEEN STREET,
CURZON STREET, LONDON, W.1
Telephone: GROSVENOR 8362-5
Midland Office: WILFORD CRESCENT,
NOTTINGHAM Tel.: NOTTINGHAM 88008

WZ 108/4a

PUNCHES
Piercing and Pull-through
PINS Ejection and Locating
TOOL LIFTS

Precision piercing punches for press tools and printed circuits. *Pull through punches* for tapping. *Ejection pins* for die-casting, injection or compression moulding. *Locating pins* from ·0394in. up to ·591in. *Tool lifts* for dismantling press tools.

SPRING TENSION
DOWEL PINS · BUSHINGS · SLEEVES AND BOLTS

No reamering and exact measuring of holes. Wide field of application. Spring fit, resilient and shock absorbing. Easily exchangeable. Labour saving. Extraordinary low prices—*BUT HIGHEST QUALITY.*

Apply for catalogues and price lists M.I. to :—
WELWYN TOOL CO LTD · Stonehills House · Stonehills · Welwyn Garden City · Herts
Telephone: WELWYN GARDEN 25403 (3 lines)

TEMPO *Automatic* **SAW SHARPENER**

Slitting Saws
Hacksaw and
Bandsaw Blades

... accuracy with automatic sharpening

Grinds Slitting Saws up to 15¼in. dia. Hacksaw blades up to 2⅜in. × 28in. and Bandsaw blades 1¼in. wide.
An accurate retoothing device is fitted.
EARLY DELIVERY
Send for Comprehensive Illustrated Brochure
Exclusive Distributors in the United Kingdom

ELGAR **MACHINE TOOL COMPANY LIMITED**
172-178, VICTORIA ROAD - ACTON - LONDON, W.4 - Tel. ACO 5555
Midlands Showroom: 1075, Kingsbury Road, Birmingham, 24
Tel. Castle Bromwich 3781/2
NRP 3352

HARRISON

DIE CAST ALUMINIUM ALLOY WITH CAST IRON INSERTS

HAND WHEELS

Solid aluminium or rotating bone handle. Curved and straight arm types. Standard range of sizes from 3" to 18" dia. Good deliveries. Specials to order.

R. C. HARRISON & SONS
(BRASS FOUNDERS) **LIMITED**
COUGH ROAD, LEICESTER. Telephone: 67809 Established 1911

Spectra color

engineers' layout and identification fluid

Now available in handy aerosols for ease and economy

Applications

Marking out bright and black metals, rawcastings, etc.

Drilling, machining, scraping and fitting.

Tool marking and general store use.

Inspection Department use for batch and shift work marking.

Colours

Black*, Blue, Red, Green, Orange, Pink, Violet, Magenta, Yellow, White†

** Transparent only † Opaque only*

Prices

Transparent	Opaque
Pt. 7/9	Pt. 9/3
Qt. 13/3	Qt. 16/6
Gall. 45/-	Gall. 55/-

And
SPECTRA COLOR SPRAY
in transparent blue only
6 oz. aerosols **7/6**
SPECTRA COLOR REMOVER
Pt. 4/9, Qt. 7/9, Gall. 19/3.

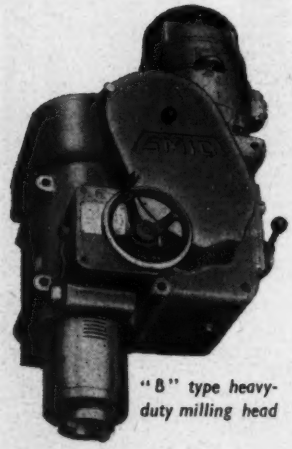
- **Gives a thin durable film of solid even colour**
- **Dries instantly—reduces waiting time**
- **Cannot crack, peel, chip or flake**
- **Resists petrol, water and most oils**
- **Transparent grade for all bright metals**
- **Opaque grade for all black metals and castings**
- **Easily removed with SPECTRA REMOVER**

For full details write:

Spectra Chemicals Limited

Spectra Works, 31 High Street, Caterham, Surrey
Tel.: Caterham 4231. Grams: Spectra Caterham

From Planer... to PLANO-MILLER



"B" type heavy-duty milling head

With the SMID range of Planer Convertions including Milling Heads and Reduction Drives

The full range of SMID Machines includes the ALBO light-duty milling heads, the BONTOFA range of medium-duty heads with horsepowers from 3—7 all available with swivelling rise and fall back plates and the "B" type heavy-duty heads built in a variety of capacities. Reduction drives including planetary types for reducing table speeds of planing machines to milling feeds, gearboxes for cross-milling and the range of CARLUT planer drives for converting belt-driven machines.

Write or phone :

SOAG MACHINE TOOLS LTD

JUXON STREET LAMBETH LONDON SE11 · RELIANCE 7201

SOAG

VULCASCOT

Anti-Vibration Pads

THE OIL RESISTING RUBBER MACHINE MOUNTINGS

Standard Sizes: 18in. by 18in. by 5/16in. and 36in. by 18in. by 5/16in.

★ **Improve Production:**

- Check vibration, shock and noise
- Make machine installations easy
- Combat nervous strain
- No fixing bolts required
- Save maintenance time and cost
- Isolate loads up to 4 tons per sq. ft.

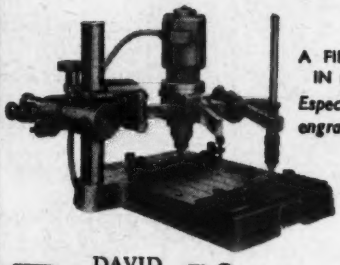
Golden Jubilee 1961

For further details write or phone the manufacturers

VULCASCOT (GT BRITAIN) LTD.

87-89 ABBEY RD. LONDON NW8.

The LOWEST PRICED engraving machine IN THE WORLD!



A FIRST CLASS JOB IN EVERY DETAIL

Especially suitable for engraving labels, etc.

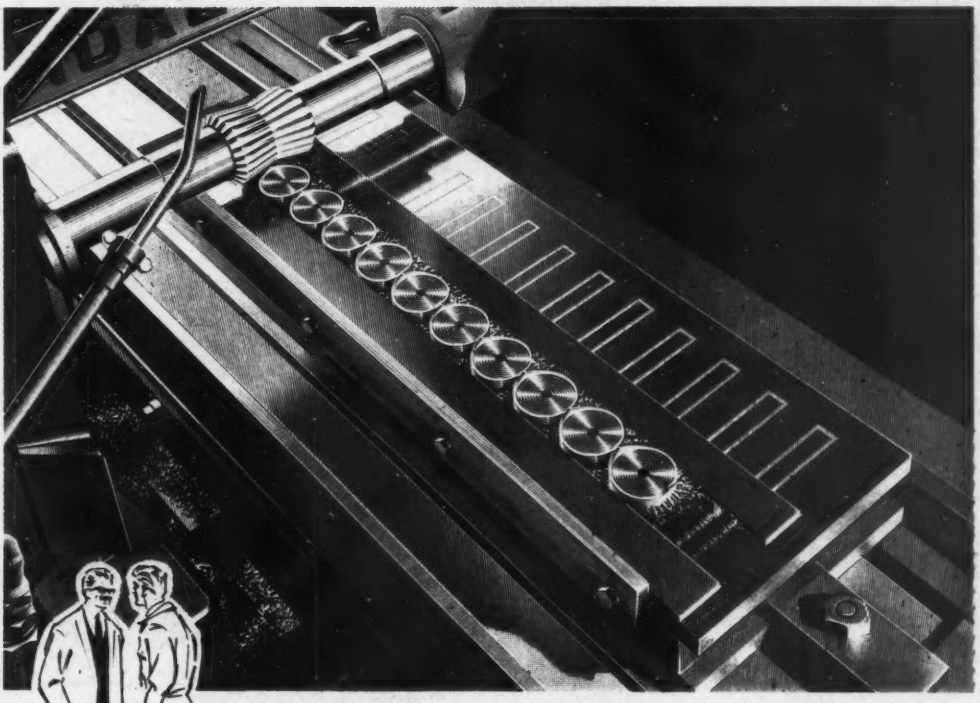
DAVID **Dowling** model **848**

Reduction range 2 : 1 to 4 : 1. Vertical adjustment to suit workpiece height. Coverage from 5in. x 3in. to 2¼in. x 1¼in.

Write for details of our complete range of engraving equipment.

DAVID DOWLING LIMITED · HAROLD WOOD · ROMFORD

TELEPHONE : INGREBOURNE 43904/5



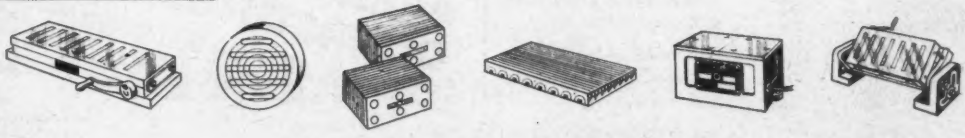
. . . there's no better way to hold small components securely . . .

Eclipse

the first name for magnetic tools

For the "know-how" to help with your chucking problems the unrivalled experience of the originators of permanent magnet workholding is at your disposal.

Exhibiting on Stand No. 3509, Pavilion 3, 7th European Machine Tool Exhibition, Brussels.



users' handbook and technical specifications available on request

MADE BY JAMES NEILL & CO (SHEFFIELD) LIMITED—SUPPLIES THROUGH YOUR USUAL 'ECLIPSE' DEALER

MARLOW VERTICAL MILLING MACHINES

• Backgeared Head 85-1,500 r.p.m. 6 speeds. • 5 speed Direct Drive, 375-2,250 r.p.m. available on Models 1, 2 and 3. • All models have Swivel Head. • Power feed available as an extra on all models except 1 and 2. • Down Feed Head, hand operated, available on Models 4 and 5 and Turret Mills.

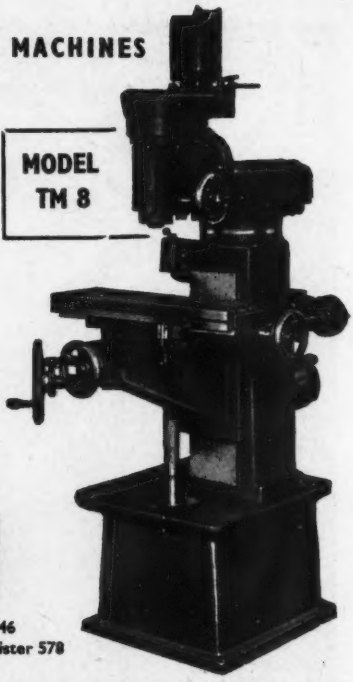
STANDARD MILLS

Model	Table	Table to Spindle
1	22in. by 6¼in.	16in.
2	28in. by 6¼in.	16in.
3	28in. by 8in.	15in.
4	28in. by 8in.	19in.
5	28in. by 10in.	19in.

MARLOW TURRET MILLS

Radial and Sliding Arm, Swivelling and Down Feed Head. Power Feed to table optional.

Model	Table	Table to Spindle
T.M.8	28in. by 8in.	19in.
T.M.10	28in. by 10in.	19in.



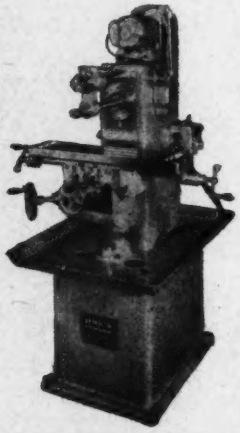
VICTA ENGINEERING CO.
Head Office THICKET CORNER · MAIDENHEAD Phone 50

London Area: Eagle Works, Chester Road, Boreham Wood, Herts. Tel: ELS 3146
Southern: Eagle Works, Blandford Road, Hamworthy, Poole. Tel: Lytchett Minister 578

"SENIOR"

PRECISION MILLING MACHINES OF OUTSTANDING VALUE

FINE LIMITS—SUPERB FINISH



'JUNIOR' MODEL
Table 20 by 4½in. £277-7-0

'M.1' MODEL
Table 26 by 6½in. £365-10-0

'MAJOR' MODEL
Table 34 by 6½in. £435-7-6

All prices include standard 3 phase motor and push button starter, suds pump & fittings, cutter arbor.

Full range of attachments available, all at very attractive prices.

Full information on request from :—

TOM SENIOR (LIVERSEDGE) LTD.,
ATLAS WORKS · LIVERSEDGE · YORKS · ENGLAND

REMEMBER!

TAL

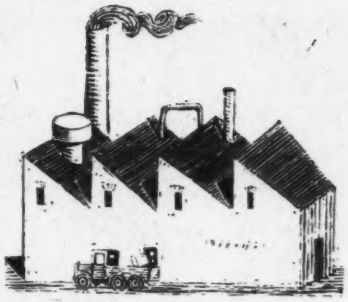
for

CERTIFIED ZINC ALLOY ZAMCA DIE CASTERS

PRESSURE DIECASTINGS
ZINC B.S. 1004 OR ALUMINIUM
LARGE OR SMALL

Enquiries to

T.A.L. DEVELOPMENTS LTD.
BROADWATER WORKS, GARMAN ROAD, TOTTENHAM, N.17
TELEPHONE: TOTTENHAM 3722/3

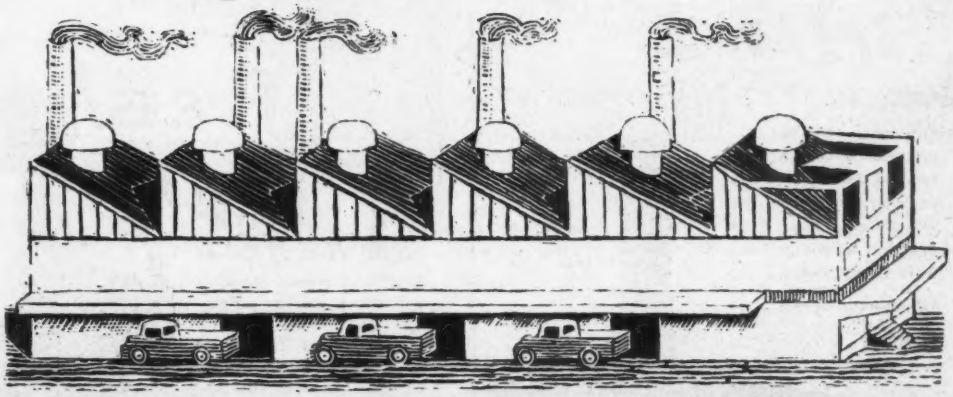


There can be no expansion in a competitive business without the regular addition of the latest machinery and equipment. This is where Mercantile Credit facilities can prove such a vital factor in your development. They enable you to acquire the machinery or plant you need out of income and additional profits, while your essential working capital remains undisturbed.

If you would like more details, please write or telephone to your nearest Mercantile Credit branch.

plus

equals



MERCANTILE CREDIT COMPANY LIMITED

Argyll House, 246-250 Regent Street, London W.1.
Telephone: REGent 7222
Member of the Finance Houses Association

There are Mercantile Credit branches throughout the United Kingdom. Please consult your local telephone directory for your nearest branch.

When answering advertisements kindly mention MACHINERY.

In fact the finer the tolerance, the greater your confidence in the precise, accurate measurement of your Shardlow Micrometer. Constant attention to engineers' problems the world over, has brought about refinements making the Shardlow Micrometer even more accurate and easy to read. This is featured in the Oblique Line Sleeve, which eliminates line reading errors of .025" (.5mm), and can be specified, at no extra cost, when ordering an Internal or an External Micrometer, but be sure it's a Shardlow—

—a very fine thing indeed!

SHARDLOW MICROMETERS LIMITED PETRE STREET - SHEFFIELD 4

Phone: 38951/2 Grams: MICROMETERS SHEFFIELD

SPEEDET

Radius Truing Dresser

This attachment will produce convex and concave radii up to 3.5in. or (metric equivalent) and will be found to be indispensable where accurate work is required.

Full technical details on request.

British Pat. No. 491589

PRICE £24 8 3

R.G. BOARDMAN TOOLS LTD.

BENSON ROAD, SOHO, BIRMINGHAM 18

Telephone: NORthern 9071. Grams: "MANBOARD", BIRMINGHAM.

Press!
and it's SECURE
Flip!
and it's FREE

When you require speedy positioning, holding down and final release on all machining and assembly operations—either for small batch, or long run work—like hundreds of other firms throughout the country, you will find the answer in

THE MULDEAN PATENT 'Camclamp'

SIZE 00	SIZE 0	SIZE 0A
17/6	20/-	22/6
SIZE 1	SIZE 2	
28/6	37/6	

Manufactured by
DEAN & MULHALL LTD.
28, SIDNEY STREET, SHEFFIELD, 1
TEL: 23071
Tracing templates supplied by request

FRACTURED!

The main casting of a Guillotine is broken through both sides to the extent of seven feet.

●

The repair was promptly carried out by METAL STITCHING—a cold repair service giving greater strength than the original casting to the broken area. Send for brochure.

REPAIRED!

COLD REPAIR SPECIALISTS WITH OPERATORS IN ALL AREAS.

- All repairs fully guaranteed.
- Metal stitching operations are performed on site.
- Rarely involves dismantling.
- Minimizes "shut-down" losses.
- Leaves castings stronger than ever.
- Residual stresses are relieved.
- Absence of heat in repair avoids danger of distortion and costly re-machining.
- Repairs can be carried out on areas subject to high heat concentration as the alloys used have a low coefficient of expansion.

Repairs are carried out by men specially trained by the Metal Stitching Company, who are able to deal with each repair according to the individual circumstances.

Repairs are treated with urgency and our representative will be sent immediately to any area on request.

Our prices are extremely competitive.

Metal stitching means SPEED and ECONOMY in replacements.

THE METAL STITCHING CO

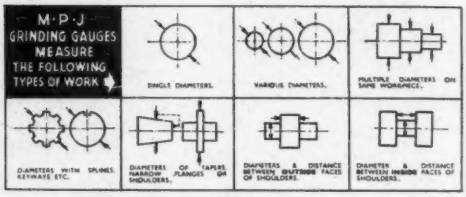
165, WINDMILL ROAD · EALING · LONDON W. 5.

Tel: ISLesworth 2746 · Grams: METALSTYCH London

Branches: MANCHESTER · GRIMSBY · SCOTLAND

CONTINUOUS GRINDING GAUGE

This Gauge provides an efficient and accurate method of continuous inspection on cylindrical workpieces whilst grinding is in operation.
The Gauge is hydraulically mounted.
Suitable Caliper Shoes are supplied as required and all contact points are tipped with Tungsten Carbide.
Fixed and adjustable shoes available to suit work requirements between ¼in. and 8in. diameter.
Can be supplied fitted with Dial Indicators 0.0001in. 0.0005in., 0.01 mm. or 0.002 mm.


M·P·J
GRINDING GAUGES MEASURE THE FOLLOWING TYPES OF WORK
SINGLE DIAMETERS.
VARIOUS DIAMETERS.
MULTIPLE DIAMETERS ON SAME WORKPIECE.
DIAMETERS WITH SPLINES KEYWAYS ETC.
DIAMETERS OF TAPERS NARROW FLANGES OR SHOULDERS.
DIAMETERS & DISTANCE BETWEEN OUTSIDE FACES OF SHOULDERS.
DIAMETER & DISTANCE BETWEEN INSIDE FACES OF SHOULDERS.

MODELS GIVING SIGNALS FOR AUTOMATIC CONTROL OF MACHINES ARE ALSO AVAILABLE

SEND DETAILS OF YOUR SPECIAL REQUIREMENTS

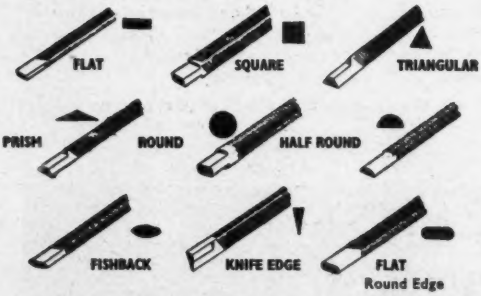
M. P. J. GAUGE & TOOL CO. LTD., ERDINGTON, BIRMINGHAM 24

HIGH GRADE MACHINE FILES

AVAILABLE EX-STOCK

61 sizes, 4", 5", 6" & 8" long with two flat tangs for THIEL III, 115 and other filing machines. All sizes in bastard and smooth cut.

17 sizes, 6", 8", & 10" long with location point and tang for THIEL 115 and other machines. Bastard cut only.



WRITE TODAY Dept.D/F for Stock list and prices

WELSH HARP, EDGWARE ROAD, LONDON, N.W.2. Tel: GLAdstone 0033

ROCKWELL MACHINE TOOL CO. LTD.

Also at BIRMINGHAM · Tel: SPRINGFIELD 1134/5
STOCKPORT · Tel: STOCKPORT 5241 · GLASGOW · Tel: MERRYLEE 2822
TF/2

For **LIGHT RIVETING, RAPID ASSEMBLY** & MARKING OF SMALL COMPONENTS

A highly efficient press with controlled and adjustable blow ensuring consistent results on large or small batches of work. Table to ram 8in. maximum working size of table 7½in. x 8½in. Full details on request.

The **MODELMARK PERCUSSION PRESS**

J. H. SHAND LTD.
AXMINSTER, DEVON

Telephone: AXMINSTER 3114

Another TWO-WAY DRILLING MACHINE

by AMT

incorporating

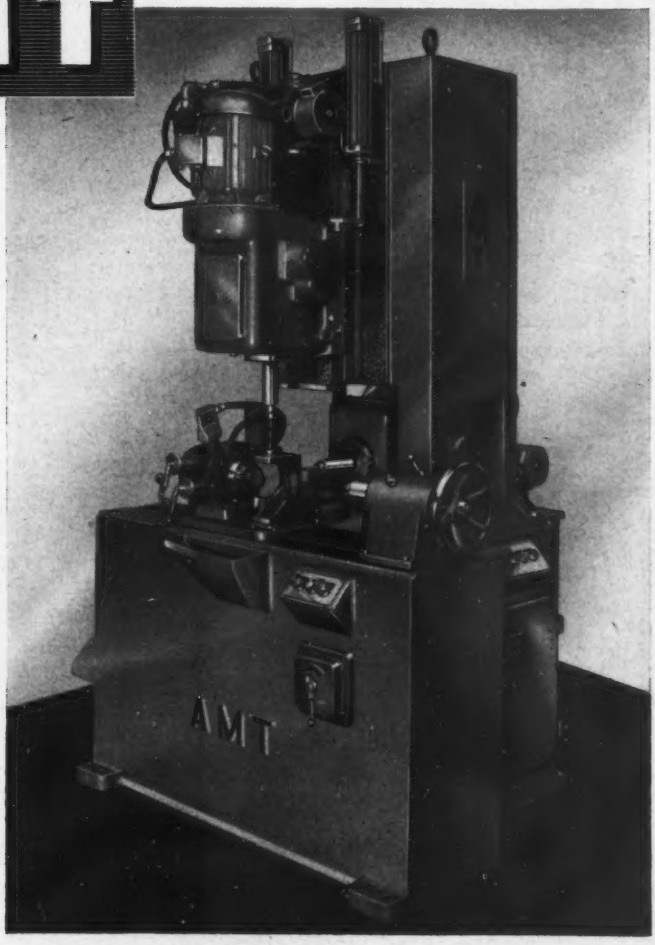
2 AMT/DI
2 h.p. UNIT HEADS

Fully automatic cycle giving 10 indexes, drilling 20 holes.

Machine recently installed at THE BRITISH PISTON RING CO. LTD., COVENTRY by whose kind permission this photograph is reproduced.

Operation:

20-$\frac{13}{32}$" dia. holes
Cycle time 2½ minutes.



The range of AMT Drilling Heads comprises four sizes from 2 to 20 h.p. Brochure and full specifications will gladly be supplied on application.

A·M·T (B'HAM) LTD. BOURNBROOK, BIRMINGHAM 29
Telephone: SELly Oak 1128/9/20. Telegrams: AMTOLD B'ham

AUTAL *TAPPING HEADS* PATENTED IN GERMANY

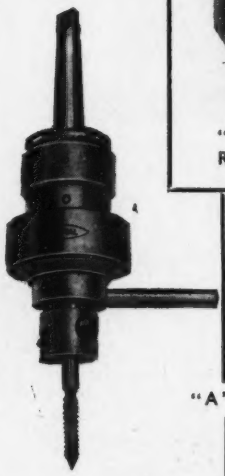
Over 600 now in use in U.K. factories

LARGE RANGE · GREATER PRECISION · LOWER COST · EVEN LESS SCRAP

All progressive Production Engineers should now consider these Precision Tools which are in increasing demand throughout industry. Consider these various features :—

- **High speed geared reverse**
- **Infinitely variable Torque**
- **Tap breakage eliminated**
- **No special Collets**
- **Five reversing and four non-reversing models giving :—**
- **Tap range from 12BA to 1¼in.**
- **"B" Type suitable for Capstans**

"B" NON-REVERSING



"A" REVERSING

IN ORDER TO DEMONSTRATE OUR CONFIDENCE IN THIS TAPPING HEAD, WE OFFER YOU ONE WITHOUT OBLIGATION FOR 7 DAYS TRIAL

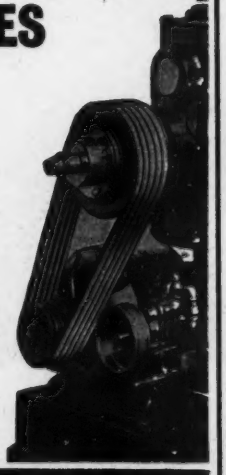
OPTICAL MECHANICAL (INSTRUMENTS) LTD

SPECIALISTS IN FINE MEASURING INSTRUMENTS AND RESEARCH APPARATUS OF OPTICAL AND MECHANICAL FORM

36a STATION ROAD · EGHAM · SURREY
TELEPHONE: EGHAM 3988-9

THRAPSTON V-ROPE DRIVES

- *FLEXIBLE*
- *EFFICIENT*
- *RELIABLE*
- *ECONOMICAL*
- *SILENT*
- *CLEAN*



With maximum horsepower and long life.

Tel.: Thrapston 531/532.

SMITH & GRACE LTD
THRAPSTON · KETTERING

CUT COSTS IN KEYWAYS

MARLCO

KEYWAY BROACHES

"Cut perfect taper or parallel Keyways with any type of hand press, without skilled labour or elaborate set up. No. 0 Set for $\frac{1}{16}$"-$\frac{1}{4}$" with guide diameters $\frac{1}{8}$"-$\frac{1}{4}$". No. 1 set or $\frac{1}{4}$"-$\frac{7}{16}$", with guide diameters $\frac{1}{4}$"-1$\frac{1}{4}$". No. 2 Set for $\frac{7}{16}$"-$\frac{5}{8}$", with guide diameters 1$\frac{1}{4}$"-2". No. 3 Set for $\frac{5}{8}$" and $\frac{3}{4}$", with guide diameters 2"-3$\frac{1}{2}$". Broaches and guides are interchangeable for non-standard Keyways."

W. H. MARLEY & CO. LIMITED
NEW SOUTHGATE WORKS, 105 HIGH RD., LONDON, N.11
TELEPHONE: ENTerprise 5234, 5578

6, 1961

G

ING

S

S

ED
N.11

Tarquin House,
Poyle Road,
COLNBROOK,
Bucks.

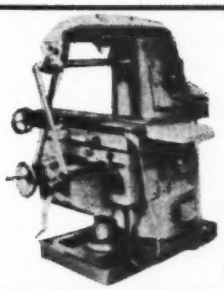
Sirs,

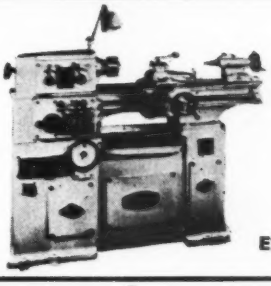
We wish to advise you that we have been entrusted by TECHNOIMPEX of BUDAPEST with the sale of their well known Centre Lathes, Milling Machines and Three Dimensional Pantograph Engraving Machines in the United Kingdom.

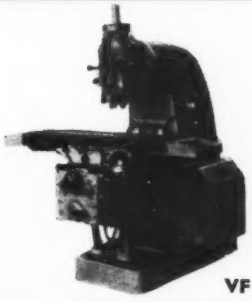
We are now able to offer a number of Models for immediate delivery. Why not take this opportunity to visit our Showrooms and inspect these Machines under power. Our Staff of factory trained Technicians being available to advise on machining problems at all times.

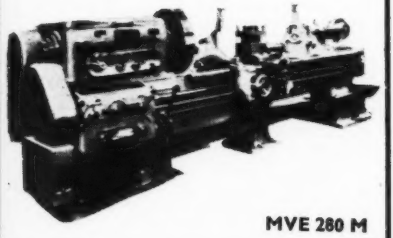
Your enquiries are cordially invited.

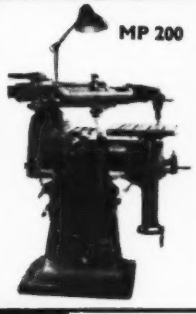
Yours faithfully,
THE TIMES MACHINERY CO. LTD.

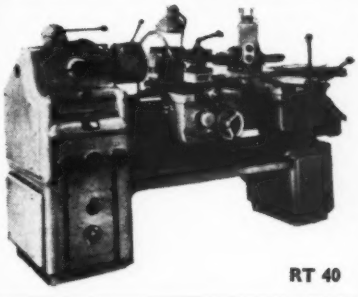

ME 1000


E2N


VF 222


MVE 280 M


MP 200

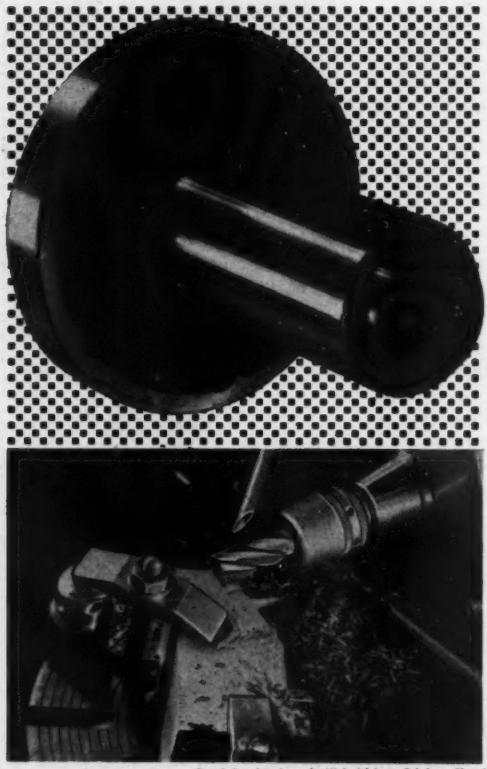

RT 40

TIMES

THE TIMES MACHINERY CO LTD
Poyle Road · Colnbrook · Slough · Bucks
Telephone : Colnbrook 2442 (3 lines)

STIEBER CLAMPING TOOLS

"Perfect Grip" type



Straight shank endmill held in a Stieber Chuck

Optimum grip—
Utmost precision . . .

PERFECT GRIP Clamping Tools are available in a wide range of arbors, mandrels and chucks in which the clamping element is a solid sleeve, expanded or contracted by means of precision rollers.
Result—absolutely parallel adjustment of the sleeve and optimum gripping power.

MSE

Enquire also about SPIRAL Type and SEGMENTAL Type clamping tools for wider workpiece tolerances.

MACHINE SHOP EQUIPMENT LTD.
Spenser St., London, S.W.1. Tel: Victoria 6086
GD 640b

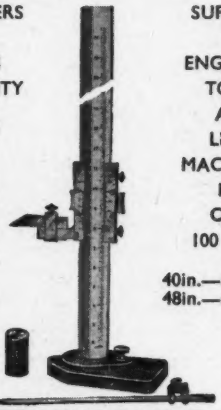
BUCK & RYAN LTD

ESTABLISHED 1824

VERNIER CALIPERS AND HIGH GAUGES TO 48in. CAPACITY

MICROMETERS GAUGES FINE TOOLS OF ALL DESCRIPTIONS

NO. 369
12in.—£41 8s.
18in.—£69.
24in.—£89 14s.



SUPPLIERS OF ENGINEERS' TOOLS AND LIGHT MACHINERY FOR OVER 100 YEARS

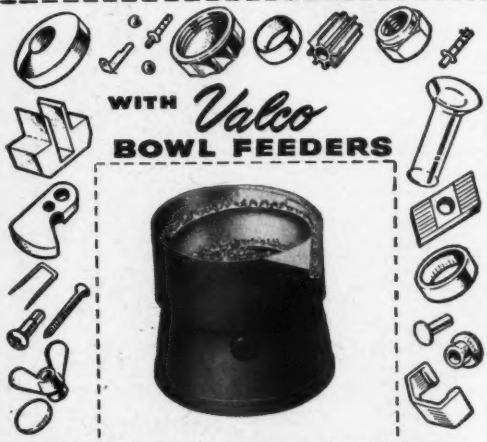
40in.—£172 10s.
48in.—£207

OUR EXTENSIVE RANGE IS AT YOUR DISPOSAL

310/312 EUSTON ROAD, LONDON, N.W.1
AND AT
261 EDGWARE ROAD, LONDON, W.2.

Telephone; EUSton 4661

AIDS TO AUTOMATION


WITH Valco
BOWL FEEDERS

For the feeding of small components to automatic machines of all descriptions. Components are fed out in single file in correct alignment to be received by the machine. Rate of feed variable, easily set to suit the particular job.

Feed tracks can be designed to handle awkwardly shaped components in the manner required.

Bowl Feeders available in a range of sizes from 6" to 36" diameter.

Send for leaflet No. 160.

MANUFACTURERS OF VIBRATORY FEEDING AND ELEVATING EQUIPMENT FOR POWDERS, GRANULES, ETC.

VALLEY PRODUCTS (LYE) LTD
MANUFACTURERS OF VALCO AUTOMATIC WEIGHING AND FILLING MACHINERY
VALLEY ROAD . LYE . STOURBRIDGE (NR. BIRMINGHAM)
TELEPHONE LYE 2324

FOCUS ON EFFICIENCY WITH INDUSTRIAL DIAMONDS

More and more lenses are being formed with diamond abrasives.
Only diamond tools can cut, grind, or polish with the speed and accuracy needed today.

To find out if diamond abrasives, diamond tools, or diamond impregnated wheels can help you in *your* problem, please get in touch with the Industrial Diamond Information Bureau. This Bureau is backed by the world's largest laboratory devoted to diamond technology—The Diamond Research Laboratory in Johannesburg. For information and advice, without obligation, please write to the address below.

The Industrial Diamond Information Bureau
2 CHARTERHOUSE STREET (DEPT. 3), LONDON, E.C.1.
Telephone: Fleet Street 7157

A Really Fast "Torquer"

SAFEST & GREATEST TORQUE WRENCH OF THEM ALL.
Fast, Accurate, Foolproof. Will tighten 1, 100 or 100,000 nuts to exactly the same degree of tightness.

ALL MODELS OPERATE

LEFT HAND & RIGHT HAND

Triple Safety Signal by TOUCH, SIGHT & SOUND
All models adjustable.
No special setting rig required.

RANGE - 8 Models cover 2 to 700 LBS/FEET or .276 to 96.74 m-kg.
Drive Sizes: ⅜", ½", ¾" & 1" Square.

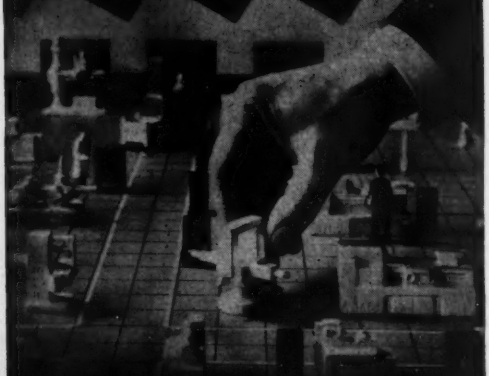
TOOL UP WITH CHROME ALLOY STEEL BRITOOL SERVICE TOOLS

Manufactured at BRITOOL WORKS, BUSHBURY, WOLVERHAMPTON, ENGLAND.

See our Stand No. 469, Transport Service Equipment Section, International Motor Exhibition, 1961.

PLANNING MODELS

Save space and time in all shops large or small



Handbook: 'THREE-DIMENSIONAL FACTORY LAYOUT'
From: VISUAL PLANNING SYSTEMS LTD
ATHLON RD., ALPERTON, MIDDX. Perivale 9935.6

FOR HARD STRONG THREADS IN SOFT MATERIALS

you Can't beat

CROSS
THE BRITISH WIRE THREAD INSERTS

★ HARD THREADS IN SOFT MATERIALS
★ NEW THREADS IN DAMAGED COMPONENTS
FULL RANGE OF SIZES AND THREAD STANDARDS IMMEDIATELY FROM STOCK

CROSS MANUFACTURING CO. (1938) LTD.
BATH, SOMERSET. Tel.: COMBE DOWN 2365. Grams: CIRCLE, BATH
Specialists in the manufacture of Jet Engine Labyrinths, Circlips, Spring Washers, Springs, etc.

MACHINERY'S HANDBOOK

The finest reference book in the world for all those engaged in the metal-working industries

Completely up-to-date
Enlarged to 2104 pages

The latest edition with its new features, additions and revisions is absolutely up-to-date, and because the old tried and proved features of fundamental value are retained, MACHINERY'S HANDBOOK is of greater practical value than ever before.

Whether your interest is engineering, design, or production, this book, enlarged to 2,104 pages, gives the latest facts, formulas and dimensional data available for ready reference.

Profusely illustrated with easy-to-read diagrams. Written by practical engineers who explain not only "how" but "why."

Handsomely bound and produced to give years of everyday use. Over 1,250,000 copies of this remarkable book have been sold.

Thumb indexed into 14 quick reference sections: Log tables; Trig tables; Mechanics; Strength of materials; Gearing; Screws; Threads; Limits and fits; Small tools; Speeds, feeds; Steels; Non-ferrous alloys; Weights; Measures; Index.

Over 1,250,000 copies already sold!

AN INVITATION TO INSPECT without deposit or obligation

You can handle and examine a copy quietly in your own home. Just sign and post this coupon and the latest edition will be sent post free by return. No deposit of any kind is required. Could any offer be fairer? Sign the coupon—NOW! Free examination scheme applies to U.K. and Eire only.

To MACHINERY, National House, 21 West Street, Brighton 1, Sussex.

Please send me MACHINERY'S HANDBOOK

1. For which I enclose CASH for 96/-.
2. By C.O.D., for which I will pay postman 96/- on delivery
3. For FREE INSPECTION, in which case I will return it to you in five days or pay
   (a) CASH 96/- in full within 10 days from invoice date, or
   (b) 106s. by INSTALMENTS of 16s. in 10 days and 18s. monthly.

SIGNATURE .....

NAME .....

ADDRESS .....

.....

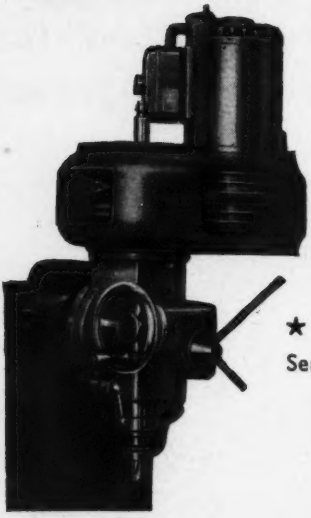
FIRM .....

POSITION .....

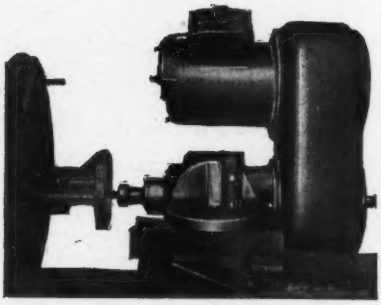
WRITE FOR COMPLETE BOOK CATALOGUE.

NOTE: Overseas orders must be accompanied with cash price, plus 4/- postage.

HORNAMILL



THE FULLY
UNIVERSAL
HORNAMILL
EASILY MOUNTED
ON LATHES,
MILLERS
PLANERS AND
SURFACE PLATES



or milling, drilling, boring, and grinding

★ **FROM £105**

Send for details to—

HORNAMILL MACHINE TOOL CO. LTD.
238 DAWES ROAD · LONDON · S.W.6.
'Phone: FULham 8247

THIS IS JUST
1
OF MANY MODELS

Large Figure Counter

Figures are clearly visible from a distance. Available as revolution or stroke type. Quick-action lever re-set.

May we send fuller details?

TRUMETER
COMPANY LIMITED
MILLTOWN STREET, RADCLIFFE, MANCHESTER.
TELEPHONE RADCLIFFE 2675/6

CW.8336/1

CAMS AND TOOLS

For
Single Spindle
Automatic Lathes

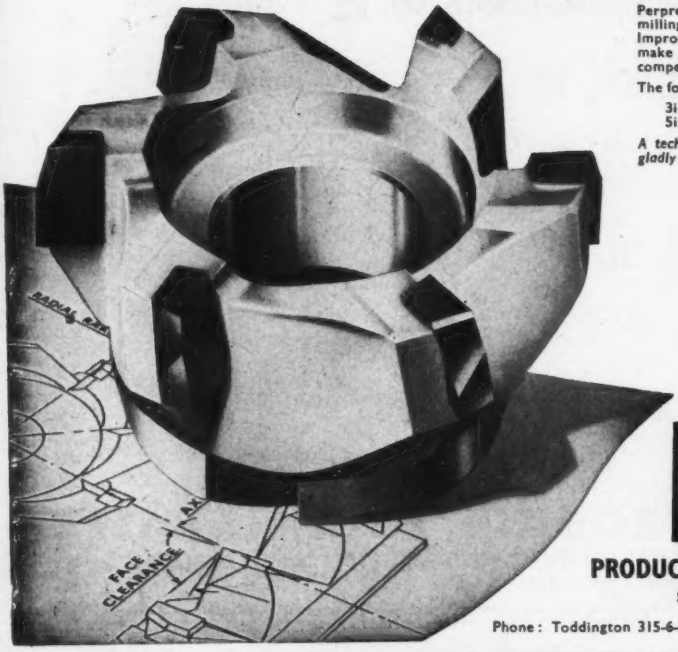
CAM BLANKS ALWAYS IN STOCK

HAESLER SALES
4 GRANGE STREET, ST. ALBANS, HERTS.
Telephone: ST. ALBANS 54336-7

Anderton CIRCLIPS

CATALOGUE from ANDERTON SPRINGS LTD (A6) BINGLEY 2388
LONDON OFFICE: HOL 5151 & 5305

PRODUCTION TOOL ALLOY CO LTD



Perpro have developed their carbide tipped face milling cutters to give an outstanding performance. Improved manufacturing facilities and heavy demands make it possible to offer these cutters at highly competitive prices.

The following sizes are available from stock :—

3in. dia. £8. 0. 0.	4in. dia. £8.10. 0.
5in. dia. £10. 0. 0.	6in. dia. £11 0. 0.

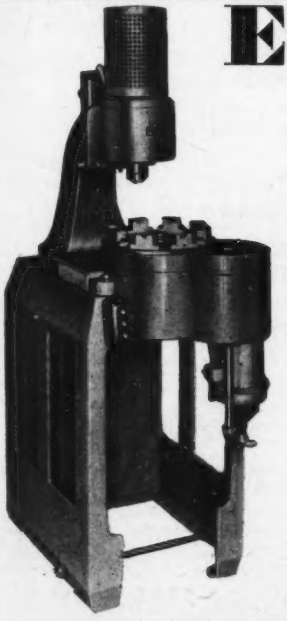
A technical brochure describing Perpro products will gladly be sent to you on request.

Perpro

PERPRO
Tungsten Carbide Tools

PRODUCTION TOOL ALLOY CO. LTD.
SHARPENHOE · BEDFORD
Phone: Toddington 315-6-7 Telegrams: Perpro, Luton Telex: 82145

ELMEG Automatic Electro-Magnetic Press



Consider these features :—

- ★ Variable Blow Force up to 3½ tons
- ★ Up to 4,000 strokes per hour
- ★ 8 Station Dial Feed with Variable Speed
- ★ Single and Repeat Stroking
- ★ Adjustable Daylight

Demonstrations gladly arranged at our London Showroom

Birmingham Showroom :—
1075, Kingsbury Road, Birmingham 24.
Tel.: Castle Bromwich 3781.
Telex: 21111 Elgatool, London.

Sole Scottish Agents :—
Angus & Crichton (Sales) Ltd.
7, Midland Street, Glasgow, C.1. Tel.: City 4560.

Exclusive Distributors in the United Kingdom

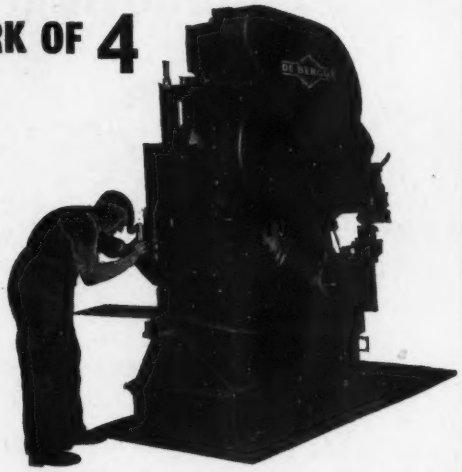
P&S The PRESS & SHEAR Machinery Co. Ltd
172-178 VICTORIA ROAD · ACTON · LONDON W3
Telephone: ACOrn 6127 Telegrams: PRESACT LONDON TELEX

When answering advertisements kindly mention MACHINERY.

THIS MACHINE DOES THE WORK OF 4

TAKES UP THE SPACE OF 1

- PUNCHING
- SECTION CROPPING
- PLATE SLITTING
- NOTCHING



D. BERGUE 4 IN 1

MULTI-PURPOSE MACHINE

SEND FOR BROCHURE (M)

Made in several sizes, these robust machines with recent improvements in design are an invaluable asset to constructors in STEEL.

A new range of Guillotines of modern design will shortly be available. Full particulars on request.

D. BERGUE MACHINE TOOLS LIMITED

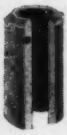
WEST GORTON, MANCHESTER 12, ENGLAND

Telephone: EASt 2771

GREATER

security .....

LOWER production costs **WITH CV HOLLOW TENSION PINS**



Equal in sheer strength to solid mild steel pins, they are the answer to many fixing problems. Reaming becomes unnecessary—C.V. vibration absorbing Tension Pins are easily inserted into misaligned holes and will not shake loose. Their application eliminates the need for taper, dowel and split pins. Maintenance is simplified . . . simply drift out and re-use!

There are also light duty pins, especially suited for use with alloys, porcelains, plastics, etc. Diameters range from 1/16in. to 2in., and there is a large range of metric sizes available.

Highly Competitive Prices — Generous Quantity Discounts

Write now for fully descriptive catalogues to :

HEADLAND ENGINEERING DEVELOPMENTS LIMITED

PRODUCTION PRODUCTS DIVISION

LOWER MARSH, LONDON, S.E.1

Telephone: Waterloo 7752/3

Quick **MEC**

Where accurate knurled patterns are required THIS IS the Quick answer!

'QUICK' knurls are a new approach to all kinds of knurling. These tools do not compress or displace the metal to produce the knurled pattern, but on the contrary, *mill* it.

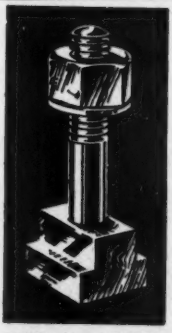
A complete range of 'QUICK' Knurling Tools is available for centre lathes, combination turret lathes, multi-spindle and turret type autos, and provide for diameters from 1/32in. up to 110in.

MORTIMER ENGINEERING Co. Ltd.

MORTIMER HOUSE, Acton Lane, London, N.W.10.

Tel. ELGar 3034

NRP 5087



Save time and money

'MURENCO'

'T' BOLTS & NUTS

EVERY SIZE IN STOCK · ANY LENGTH

IMMEDIATE DELIVERY

FREE SET OF T-SLOT GAUGES AND ILLUSTRATED LEAFLET ON REQUEST

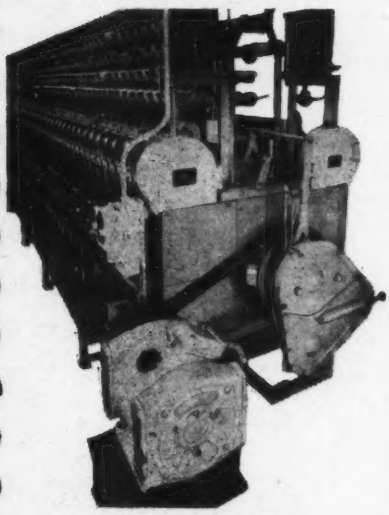
MURRAY'S

(PRETORIA)

ENGINEERING CO. LIMITED

26/28 PRETORIA RD., ROMFORD, ESSEX. TEL: ROMFORD 42380

When answering advertisements kindly mention MACHINERY.



horses for doublers

The installation of a "POLY-V" 'M' section belt on a Prince Smith and Stells' Doubler Drive has increased horse power, saved space, and overcome completely the inadequate loading of the flat belt fitted previously.

You may have a power transmission problem.

TURNERS

POLY-V (TRADE MARK)

DRIVES

could provide the complete answer—they transmit more power, while saving time, space and money.

TURNER BROTHERS ASBESTOS CO. LTD., ROCHDALE, LANCS.
A MEMBER OF THE TURNER & NEWALL GROUP.

Prolong drill life . . . maintain high cutting performance

You really must find a place in your tool-room or machine shop for a Hunt Drill Point Grinder. It will ensure better drill point sharpening and point thinning, longer drill life, more accurate holes and faster rates of penetration in whatever metal you handle.

Ask for details of our range which includes medium and heavy duty models.

HUNT
MACHINE TOOLS

TWIST DRILL POINT GRINDING MACHINE

HERBERT HUNT & SONS LIMITED
MACHINE TOOLS

Elsinore Road, Old Trafford, Manchester 16, England

Tel: Trafford Park 0663
Grams: Hunting Manchester 16

Taylor AIR CLUTCHES

(Patented)

WITH COMBINED AUTOMATIC BRAKE

— FOR SMOOTH, POSITIVE, CUSHIONED POWER

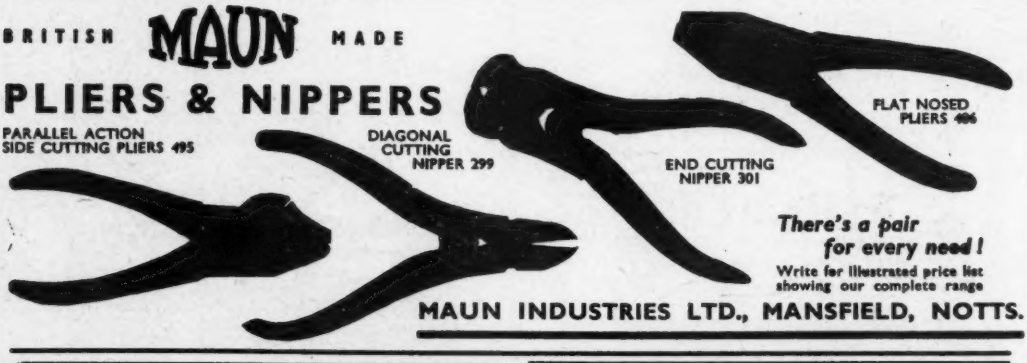
These clutches not only ensure full power with smooth, shock-free engagement at higher speeds, but also contribute to faster production and better all round performance on all types of Presses, Forging Machines, Press Brakes, Shears, etc. Synchronised, powerful, quick acting braking ensures positive safe stop which means quick and accurate control with increased safety for operators and tool setters.

A standard range of sizes is available and details will be sent on request.

TAYLOR INDUSTRIAL CLUTCHES TROWS UPPER WORKS, CASTLETON, LANCS.

BRITISH **MAUN** MADE

PLIERS & NIPPERS

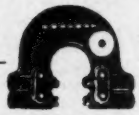


There's a pair for every need!

Write for illustrated price list showing our complete range

MAUN INDUSTRIES LTD., MANSFIELD, NOTTS.

QUICK **"EESESET"** SETTING **ADJUSTABLE** **CALIPER** **GAUGES**



ENSURE RAPID PRODUCTION

Delivery from stock

SIZES 0—½in., 22/6 | 0—1in., 23/- | 1—2in., 28/- | 2—3in., 30/- | 3—4in., 35/- | 4—5in., 38/6 | 5—6in. 48/-

NET PRICES

Illustrated leaflets from

EESESET GAUGES LTD.

153c, ALBANY ROAD, COVENTRY

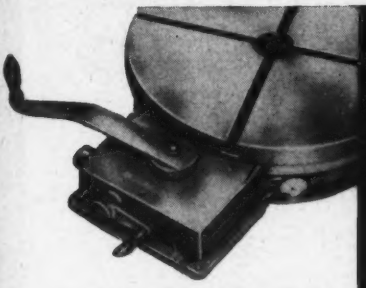
Telephone: Coventry 75788

HOOTERS FOR WORKS ENGINE ROOMS, ETC.

from air tank or Desilux small electric compressor. Range of audibility 1-4 miles.

"DESILUX"

143 Whitfield Street, London, W.1 Euston 5888



PEISELER Circular Indexing Tables and Faceplates *drastically reduce handling time...*

PEISELER CIRCULAR INDEXING TABLES

Hand and electrically operated

These tables incorporate hydro-mechanical faceplate clamping, give maximum stability and high-grade indexing accuracy together with quick indexing action. They have a low overall height, are simple to use and reliable and foolproof in service. From 10in. to 49in. diameter.

PEISELER INDEXING FACEPLATES

Hand and electrically operated

Incorporating the same basic features as the Indexing Tables (opposite) these Faceplates obviate the use of heavy and expensive box-type jigs and fixtures—and no manhandling is required. From 7in. to 55in. diameter.

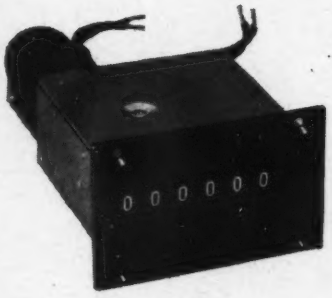
MSE **MACHINE SHOP EQUIPMENT LTD., Spenser St., London, S.W.1. Tel: VICtoria 6086**

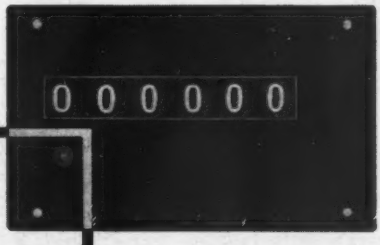
GD 638

VEEDER-ROOT

When you need COUNTING SPEED

E2—60





INSTANTANEOUS RE-SETTING BY PUSH-BUTTON OR SOLENOID

Send for technical information

VEEDER-ROOT LTD

Division E

King Henry's Drive New Addington Surrey

Telephone Lodge Hill 3344-6

Specify VEEDER-ROOT Quick Reset, High Speed Magnetic Counters

The 1585 (Manual Reset) and the 1557 (Electrical Reset) are designed for accurate, dependable, remote indication of machine operation, or for counting articles at high speed. Speed is 3,000 counts per minute, manual or electrical reset, 6 figures. Made for panel mounting.

HEDGES REINFORCED PLASTICS LTD.

GLASS FIBRE REINFORCED PLASTIC MOULDINGS
MACHINE COVERS — SAFETY GUARDS
HOPPERS — CONTROL CABINETS
DUCTING — DOORS — OIL TANKS, ETC.

DALSTON GARDENS, STANMORE, MIDDX. WORDSWORTH 6848

The MILLAR OPTICAL PROTRACTOR

First zeroed by reference to the machine table it gives angular readings accurate to one minute. The most modern way of making angular settings of tool slides and milling heads on planing, vertical boring or milling machines.

MORTIMER ENGINEERING Co.Ltd.

Mortimer House, Acton Lane, London, N.W.10 Tel: ELGar 3834

NRP5086

TAPER PIN REAMERS

PROMPT DELIVERY OF ALL SIZES

TEL: STAFFORD 304

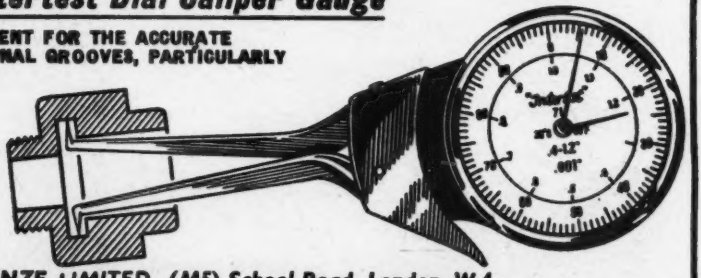
J. H. LINES LTD. 46 Stone Road, Stafford

Shockproof Jewelled Movement

The Intertest Dial Caliper Gauge

AN IDEAL INSTRUMENT FOR THE ACCURATE MEASUREMENT OF INTERNAL GROOVES, PARTICULARLY CIRCLIP GROOVES

Model	Range
51	·2"-·6"
52	·4"-·8"
71	·4"-1·2"
72	·8"-1·6"
73	1·2"-2·0"
74	1·6"-2·4"
75	2·0"-2·8"
76	2·4"-3·2"



Full details from: CAROBRONZE LIMITED, (M5) School Road, London, W.4.

ABSTERGE (to clean by wiping)

Austins supply the best cleaning cloths for every purpose. Some jobs call for coarse, heavy fabric, some for soft, closely woven materials —we can meet all requirements with carefully selected cloths that are thoroughly washed and sterilized in our own plant. Orders of all sizes are handled with promptness and reliability. Please let us quote you for regular supplies.

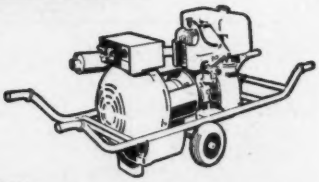
AUSTINS Industrial cleaning cloths
E. AUSTIN & SONS (LONDON) LIMITED · GUN WHARF
Gunmakers Lane · London · E.3 · Tel. ADVance 1211

On-Site WELDING

PORTABLE WELDING SET

For any Welding jobs down to a 4 gauge rod. The most powerful small set available. Weight 2½ cwt.

Price £290



Home Counties Distributors:
MOBILE HAULAGE LIMITED
230 Tottenham Court Road, W.1. Telephone: LANgham 7833-4-5.

CLASSIFIED ADVERTISEMENTS

RATES: LINE (All type, except Situations Wanted), col. width 1⅞ in., 13 lines per inch., min. 4 lines, 1 line averages 6 words, 2/6 per line single insertion (series discounts on request). "SITUATIONS WANTED," 1/11 per line, min. 4 lines.
DISPLAY (with or without blocks), £2 6s. 0d. per inch single column and pro rata (series discounts on request).
BOX Nos. 2/- extra. Classified advertisements can be accepted at London Office up to Wednesday preceding following Wednesday's issue.

CONTRACT WORK

••• DESIGNS •••

NOW!! SPARK EROSION TO THE TRADE
On Precision Swiss Eleroda Machine
Reduce Press Tool costs
CARBIDE—FORGING—EXTRUSION
IMPACT EXTRUSION DIES
We also modify existing tools

PRESS TOOLS
LAMINATIONS—COMBINATION—PROGRESSION, ETC.
JIGS—FIXTURES
PROTOTYPE MACHINING
Designing—Short Order Work—Sub Assemblies Completely Tooled
JIG BORING AND PRECISION GRINDING
LANDEN (ENGINEERS) LTD.
1a, Aubert Park, Highbury, London, N.5
Phone: CANonbury 1075

DESIGN & PLANNING
PRESS TOOLS
JIGS & FIXTURES
SPECIAL PURPOSE M/CS
DIECASTING MOULDS
PLASTIC MOULDS
PIPING, DUCTING, ETC
Export Enquiries Invited
W. R. SOUTHWELL (DESIGNS) LTD
30 ST. DUNSTANS HILL, CHEAM
SURREY 'Phone: FAIRLANDS 3617 & 7548

Research — Developments — Precision Engineering capacity available.—G. B. WHALES, LTD., Rear of 123, Old Dover Road, London, S.E.3. Tel.: Greenwich 6625.

Capacity Now Available for Design of Jigs, Fixtures, Press Tools, Moulds and Special Purpose Machinery.—BOX D183, MACHINERY, Clifton House, Euston Road, N.W.1.

PRECISION PRODUCTS
(ROMFORD) LTD.
TOOL DESIGNERS AND MANUFACTURERS
For all your needs
IN
JIGS · FIXTURES · GAUGES
PRESS TOOLS · FORM TOOLS
AND SPECIAL MACHINES
A.I.D. Approved
Viking Works, London Rd., Romford, Essex. Tel: Romford 61991/2

C.B.POWELL LTD ESTD 1945
PHONE: 71144
DESIGNERS AND MANUFACTURERS

ENGINEERING PRODUCTION EQUIPMENT
1 ST. JOSEPHS CLOSE
HOVE • SUSSEX

DESIGN & MANUFACTURE
JIGS, FIXTURES, GAUGES, PRESS TOOLS, HEAVY DIES, MULTI-HEADS, SPECIAL M/C'S
ALAN KEIR LTD.
NORTH ACTON ROAD, LONDON, N.W.10 ELG. 2612

Classified Advertisements (*CONTRACT WORK, contd.*)

HENRY MEADOWS LTD
FALLINGS PARK
WOLVERHAMPTON

MANUFACTURERS OF THE FINEST QUALITY GEARS. SPUR, HELICAL, STRAIGHT BEVEL AND EPICYCLIC GEARS. SPUR GEARS GROUND OR SHAVED 0.50" TO 40.00" DIA. 3 D.P. TO 40 D.P. EVERY CARE AND SKILL IS EXERCISED IN THE MANUFACTURE, RESULTING IN PERFECT TOOTH FORM.

PHONE: WOLVERHAMPTON 31921.

MEADOWS

• • • GEARS • • •

Gears Cut or Machined Complete. One-off or production runs.—
F. W. BAGGETT & CO., LTD.,
8, Temple Street, Wolverhampton 25794.

"TURNCO" EST. 1919
Replacement Gears for Industry
G. H. TURNER & Co. Ltd.
Bell Street, WOLVERHAMPTON.
Phone 20852 (3 lines)

GEARS *We are Specialists*

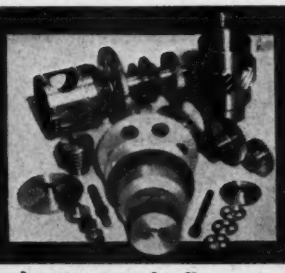
Experienced Gear cutters at your service.....
No need to let a gear problem stump you.....
Expert knowledge is on hand.....
Rapid delivery from customer's own blanks.....
All gears cut, or made complete to your requirements.....
Trust your gear-cutting to us (over 30 years experience).....
Every satisfaction assured.....
Do send your enquiries, large or small, prompt attention given

F. M. IILLICH (GEARS) LTD.
OXGATE FARM WORKS
COLES GREEN ROAD · CRICKLEWOOD, N.W.2
Telephone: GLAdstone 6322
SPIRALS · SPURS WORMS & WHEELS · BEVELS · SPROCKETS
CAPACITY LIST ON APPLICATION.

GEARS—PRECISION AND INSTRUMENT MACHINE CUT
Max. capacity 12 D.P. 8in. dia.
Blanks turned and cut.
SETON CREAGHE ENGINEERING LTD.,
TRADING ESTATE, PARK ROYAL ROAD, N.W10
A.I.D. *'Phone: ELGar 3356/7* A.R.B.

Spur Gear and Sprocket Cutting
from blanks supplied or machined complete.
Phone: EUSton 1354.
TURNER BROS.
10, Pratt Mews, Camden Town, N.W.1.

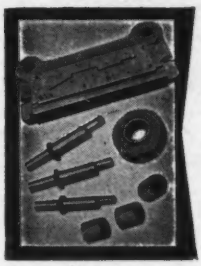
CINETRA
(A.I.D. approved)
for
FINE PRECISION ENGINEERING



Telephone: GULliver 2353 / 4085
GENERATED GEARS
10 to 100 DP, to finest tolerances
12, OVAL ROAD,
LONDON, N.W.1.

Classified Advertisements (*CONTRACT WORK, contd.*)

RODGERS BROS. LTD. BLACKWELL ST. BRIXTON RD. ENGINEERS & GEAR CUTTERS



GENERAL HEAT TREATMENT

CASE HARDENING AND CYANIDE HARDENING ON PRODUCTION BASIS OR SINGLY

SHOT-BLASTING

A.I.D. APPROVED

CROYDON TOOL AND CASE HARDENING SPECIALISTS LIMITED

UNION ROAD · WEST CROYDON

Tel. THORNTON HEATH 5222

•• ENGRAVING ••

Machine Engraving On All metals or plastics. Singles, small or long runs. Quick delivery—good workmanship—TAYLOR & PICKLES, Engravers and Stamp Makers, 27, Glovers Court, Preston, Lancs. Tel. Preston 4925.

Machine Engraving Company has capacity for work in all types of engraving. Also willing to undertake engraving on customers' own parts. Very prompt delivery. Also running emergency service.—METALOID ENGRAVING CO., 69, Knights Hill, S.E.27. Phone Gipsy Hill 2464.

GENERAL ENG'G. •• SERVICES ••

Stonebridge **PLOUGHGRINDING** Service, 707 Tudor Estate, Abbey Road, Park Royal, London, N.W.10. ELG. 5353. GROUND BLANKS SUPPLIED

Forgings

IN IRON & STEEL UP TO 3 CWTS.

GEORGE MILLS (ENGINEERS) LTD. ESTABLISHED 1910

214-218 RAVENSCROFT ROAD, BECKENHAM, KENT

A.I.D. APPROVED

SPECIAL PURPOSE MACHINES

REPAIRS & SALVAGE BY METAL DEPOSITION IN STELLITE, CHROME, NICKEL ETC.

A.R.B. APPROVED

HEAVY AND AWKWARD MACHINING & GRINDING, WELDING, FABRICATING PROFILE FLAME CUTTING AND GENERAL PRESSWORK

PROTOTYPE & PRODUCTION

ELECTRONIC WIRING, COIL WINDING, INSTRUMENTATION & TESTING

SETON CREAGHE ENGINEERING LTD., G. W. Trading Estate, Park Royal Road, N.W.10.

A.I.D. ELGAR 2356/7 A.R.B.

CASE HARDENING and HEAT TREATMENT

Quick Deliveries

BATTERY OF FURNACES INCLUDES SALT BATH FURNACES 6' 0" DEEP AND 24" WIDE

HEAT TREATMENT OF HIGH SPEED STEELS AND DIES BY CARBO-NEUTRAL PROCESS

ANNEALING AND CARBURIZING CYANIDE HARDENING AUSTEMPERING

ON A.I.D. LIST

HOLT BROS (HALIFAX) LIMITED

HOPE STREET, HALIFAX

EST 1860 PHONE: HALIFAX [illegible]

NITRAM METAL TREATMENT & ENG. CO. LTD.

SILVERDALE ROAD, HAYES, MIDDLESEX

A.I.D. A.R.B. APPROVED

BRIGHT ANNEALING

TELEPHONE HAYES 5111/2

ABBEY **HEAT TREATMENTS** LTD.

PLAZA WORKS, HIGH STREET, MERTON, S.W.19

FOR ALL TYPES OF HEAT TREATMENT

A.I.D. WE COLLECT-WE DELIVER D.I.

A.R.E. TELEPHONE: CHErrywood 2291 Arm.

INDUCTION HARDENING AND BRAZING

CYANIDE HARDENING, PACK CARBURISING

Shot-blasting

PRECISION HEATING LTD.

Island Farm Avenue, West Molesey, Surrey

Phone: MOLesey 4231

FOR :- MOLESEY 2216/7/8

A I D **HEAT-TREATMENT** A R B

J. M. HARGREAVE & CO. LTD., CENTRAL AVENUE, W. MOLESEY, SURREY

A.I.D. and A.R.B. Approved

IDEAL

HARDENING CO., LTD.

DAVIS ROAD, CHESSINGTON, SURREY

HEAT TREATMENT SPECIALISTS HARDENING OF EVERY DESCRIPTION AND SANDBLASTING

Tel.: ELMBRIDGE 6556

IMMEDIATE CAPACITY AVAILABLE

Heavy and Light Sheet Metal Work, Welding Fabrications, Press Work up to 75 tons, Milling, Turning and General Machine Shop Work, also Spray Painting and Dipping. *Send enquiries to:*

C.P.E. LTD. High Street, Cranleigh, Surrey.

Tel: Cran 911/2

V. J. COPAS LTD.,

Friar Park Road,

WEDNESBURY, STAFFS.

Tel : Wednesbury 1051/3

Precision Engineers, Instrument Makers, offer complete machining and/or assembly capacity for light to medium components in prototype or batch production quantity. All metals.

Centre lathes to 6in. capacity.

Capstans $\frac{1}{16}$in. to 2$\frac{1}{2}$in. capacity.

Milling, drilling and cylindrical grinding.

D.G.I. & A.R.B. fully approved.

••MACHINING••

AUTO TURNED PARTS

FINE TOLERANCES, MAX. DIA. 1$\frac{1}{8}$in.
INDEX SS & GRIDLEY MULTI AUTOS
THREAD CHASING MANUFACT'RS
ROLLER BOX TOOL HOLDERS

BENTON ENGINEERING CO., LTD.

Tonbridge Road, Harold Hill, Essex
Ingrebourne 43844/5.

Plough Grinding—Plate and Components—Ground Blanks supplied.—BRUNSWICK ENG. CO., 129, Ewell Road, Surbiton, Surrey. ELMbridge 5872.

Luton Engineering Pattern Co. are prepared to undertake the manufacture of all classes of wood and metal patterns, and accuracy and prompt delivery guaranteed.—Send your enquiries to 89A Princes Street, Luton. 'Phone: 961.

Immediate Capacity Available castings, non-ferrous, dia. shell moulded, sand, etc. Also machining and stove enamelling.—MILLS ENGINEERING PRODUCTS, LTD., Barnet. 'Phone: Barnet 6744.

CASTINGS

ECLIPSE FOUNDRY

& ENGINEERING CO. (DUDLEY) LTD
SEDGLEY ROAD WEST
TIPTON ● STAFFS.

GREY IRON	ALUMINIUM	NON-FERROUS	MAZAK
Jobbing Castings up to one ton	*Sand & Die Castings*	*Gunmetals Phosphor-Bronze*	*Pressure Castings*

Repetition Machine Moulded Work

HOLLAND & CAESAR LTD

ENGINEERING CONTRACTORS
GRINDING SPECIALISTS
ORKEY WKS, 3-5 LEIGHTON PLACE, LONDON N.W.5

Est. 1836 Tel- GULliver 3047 and 6444

GRINDING IMMEDIATE CAPACITY AVAILABLE—CYLINDRICAL · INTERNAL · SURFACE & DIE GRINDING 24in. x 20in. · LATEST TYPE MACHINES · PLOUGH GRINDING—24 HOUR SERVICE

also
General Machining, Fitting and Complete Assemblies

Special Purpose Machines Designed and Built to Specification

We shall be pleased to advise on your Grinding and Machining Problems

---

A.I.D. **THE** ELGar 5057/8

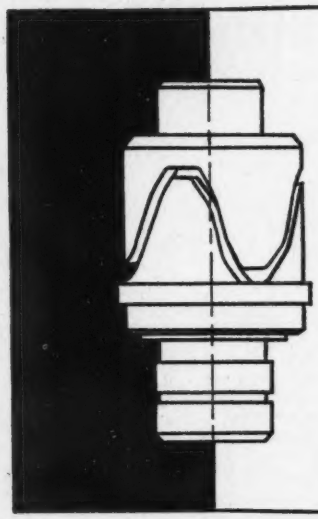
HEAT TREATMENT

PEOPLE OF LONDON

G.R.M. Heat Treatments Ltd., Coronation Rd., Park Royal, N.W.10

HORIZONTAL AND VERTICAL MILLING to Toolroom limits from 1 off to 100 off, from large fabrications to small jigs or fixtures.—E.E.H. PRECISION ENGINEERS, Bagshot Road, Bracknell.

Automatic Capacity Available Swiss Machines up to $\frac{1}{2}$in. dia., also small and miniature cylindrical grinding.—POTTER, WALLIS & CO., 45, Beaumont Road, Chiswick, W.4. Telephone Chiswick 2703.



CAM cutting

Ground Plate Cams for Cam Contour Boring Machines
Barrel Cams, milled and ground—Index Cams
Conjugates—Experimental Camshafts—Gangmasters
Ground Pump Cams—Rings and Piston Cams

zephyr cams *ltd.*

Lowestoft 1784
Freemantle Road - Lowestoft - Suffolk

Capacity available for
AUTOMATICS
Single Spindle and Multi Spindle
from Bar ¼in. - 1⅜in.
Also CHUCKING AUTOS.
BRYCE LTD
Kelvin Works, Hackbridge, Surrey
Tel: Franklin 1101

Capstan Turning is Our Business
PROMPT ACCURATE SERVICE
14 DAY DELIVERY
ILFEX METALS LIMITED,
SELINAS LANE, DAGENHAM, ESSEX
Tel: DOM 6700

Thread Milling for the Trade up to 6in. O.D. and 5in. I.D. Any thread, any quantity. Keen prices for long runs. Satisfaction guaranteed.
UNICORN PRODUCTS, LTD., 119-121, Stanstead Road, Forest Hill, London, S.E.23 Telephone: Forest Hill 7688 (3 lines).

Automatic Capacity Available, Index single spindle autos, up to 1¼in. dia. —PRESS & PRODUCTION MACHINE TOOLS, LTD., 97, High Street, Teddington. TED Lock 4032.

Automatic Capacity Immediately available. Swiss type machines up to ¾in. dia.—E. V. IRONS, Clovelly Works, 272 Acton Lane, Chiswick, W.4. CHIswick 1007.

COMPREHENSIVE CENTRE LATHE CAPACITY available up to 3ft. dia. to tool room limits. Particular attention given to individual requirements.—R.E.H PRECISION ENGINEERS, BAGSHOT ROAD, BRACKNELL, OR 'PHONE BRACKNELL 1441.

---

for **CENTRELESS GRINDING**
Up to No. 2 Cincinnati size
and **CYLINDRICAL GRINDING**
External up to 12 in dia by 36 in · Internal up to 7½in by 8½ in

MARSDEN & SHIERS LIMITED
DAVIS ROAD · CHESSINGTON · SURREY
Telephone: Elmbridge 5333 (3 lines)

AUTO CAPACITY
6in. and 4in. Chucking.
$\frac{3}{16}$in.-2in. dia. Bar, A.I.D., A.R.B. approved.
HUNTLEY & SPARKS LTD
James Estate, Western Road, Mitcham, Surrey

CENTRE LATHE
30 Ft. LONG
Capacity Available at
Graviner Manufacturing Co. Ltd., Fareham Road, Gosport, Hants.

MACHINING CAPACITY... phone: KIN 6112

PRECISION & GENERAL ENGINEERING
CAPSTANS, TURRET LATHES, AUTOS, LATHES, MILLS, DRILLS, BORERS,
ALL GRINDING, FULL MACHINE SHOP SERVICE
COMPONENT & ASSEMBLY PRODUCTION
JIGS, TOOLS, FIXTURES, PRESS TOOLS
SEND US YOUR ENQUIRIES—
UNRIVALLED EXPERIENCE—
TOP QUALITY—KEEN PRICES
W.G. MARSDEN ENG. LTD.
30 FIFE ROAD, KINGSTON - ON - THAMES, SURREY

PRECISION TURNED PARTS
D.G.I. and A.R.B. APPROVED
AUTO & CAPSTAN QUANTITIES
Send your specification to:
AYLESBURY TURNED PARTS (True Screws) Limited
Britannia St., AYLESBURY, Bucks.
Telephone: AYLESBURY 2424 (3 lines)

Automatic and Capstan Capacity Available up to 2in. dia.—WILLIS ENGINEERING Ltd., 65, High Street, Hampton Hill, Middlesex. Molesey 1121 & 2.

Automatic Capacity Available on single spindle machines.—BARMAC ENGINEERING COMPANY, Bridge Works, Iver Lane, Cowley Middlesex. Telephone: Uxbridge 38839.

Planing Capacity, Heavy or Light Turning up to 5ft. diameter. Special machines to customers' design.
F. ATKINSON & SONS (LONDON), LTD., 65, King's Cross Road, W.C.1. Terminus 4050.

Capacity Turning, Capstan milling, drilling, die and tool making. —MILLS ENGINEERING PRODUCTS, LTD., Barnet. Tel.: BARnet 6744.

Automatic Capacity Available, Index single spindle Autos. up to 2¼in. diameter. Centreless Grinding Capacity, ¼in. to 5in. diameter.
JAN PRECISION SCREWS, 629, Spur Road, Feltham, Middlesex. Telephone: Feltham 4282/3.

Multi-spindle and Single-spindle Auto Turning up to 2in. bar capacity capstan turning from the bar up to 2¼in. dia., chuck work up to 14in. dia., thread milling milling, shaping, drilling, etc., capacity available. Any tolerance and quantity. Satisfaction absolutely guaranteed.—UNICORN PRODUCTS, LTD., 119-121, Stanstead Road, Forest Hill, S.E.23 'Phone: FORest Hill 7688 (8 lines).

FINE LIMIT GRINDING
MILLING, TURNING, DRILLING.
Complete Service Offered.
SETON CREAGHE ENGINEERING LTD.,
Trading Estate, Park Royal Road, N.W.10
A.I.D. ELGar 3356/7 A.R.B.

Automatic Capacity Available. Index Autos. up to 2¼in. diameter. Chucking up to 5in.
JAMES HARRINGTON, Magda Works, Walton-on-Thames. Tel.: 26099 & 25614.

Capstan Capacity Immediately Available, 8 BA-1¼in. Steel or Brass. Large stocks of raw materials.
SACRON, LTD., 7, Chiswick High Road, W.4. Tel.: CHIswick 3595.

High Precision Grinding of Tungsten Carbide and Steel Tools. Accurate profile grinding and progression tools a speciality.—S. T., LTD., 22-26, Upper Mulgrave Road, Cheam, Surrey. 'Phone: Vigilant 0074/5.

Capstan Capacity Immediately available 10 BA to 1¼in. B.M.S. Stainless, Brass, etc. All materials in stock.—CHISWICK ENG., LTD., Pluckington Place, Southall, Middlesex. Tel.: Southall 2247.

CENTRELESS GRINDING SPECIALISTS
BAR GRINDING
A.I.D. APPROVED
1/16in. TO 5in. DIA. UP TO 15ft. LONG
all types of infeed, through and plunge
IMMEDIATE CAPACITY ON CAPSTAN, MILLING CENTRE LATHES, AUTO AND ALL TYPES OF GRINDING
REDCAR ENGINEERING CO. LTD. *Tel:* POPESGROVE 1005/6/7
8 STATION YARD GROSVENOR RD TWICKENHAM MIDDX

AIRCRAFT UNIT ENGINEERING CO.
Invite quotations for machining capacities
A.I.D., A.R.B., AND LIMITED A.R.B. DESIGN APPROVAL
Turning, Capstan and Centre Lathe. Milling, Universal, Profile. Grinding, universal, surface, centreless, etc. (up to 86in. x 15in. dia. Plain Cylindrical)
Screw Cutting (Cridan machines) and Thread Milling
General Assembly Work Modern plant producing High Quality work
18-19, Greenhill Parade, Great North Road, New Barnet, Herts.
Telephone: BARnet 6471 and 7479

Capacity Available on single spindle Autos up to 1-5/8in. Capstan 2in. Small gear cutting, milling, grinding, etc. M.O.A. approved inspection.—S.M.E. LTD., Steyning, Sussex. 'Phone: Steyning 2228.

Automatic Work up to 1¼in. Immediate capacity available. TRUE ENGINEERS, LTD., Wharf Lane, Bourne End, Bucks. 'Phone 1316.

WE MAKE TANKS, FRAMES, DUCTS, INSTRUMENT PANEL AND CHIMNEYS
Let us have your enquiries for welded fabrications large or small. And we can press 200 Tons, guillotine bend and cylindrical roll ¼in. plate.
SHELMERDINE & MULLEY LIMITED
EDGWARE ROAD, CRICKLEWOOD N.W.2.
Tel: GLAdstone 7677-8

CAPSTAN CAPACITY IMMEDIATELY available from 0.050 dia. to 30in. in any specified material. Extremely rapid service.—R.E.H. PRECISION ENGINEERS, BAGSHOT ROAD, BRACKNELL. 'PHONE: BRACKNELL 1441.

Automatic Capacity Available, B. & S. up to 1¼in. dia.—C.B. AUTOMATICS, Bridge Works, Iver Lane, Cowley, Middlesex. Tel.: Uxbridge 33428.

Immediate Capacity Available on Single Spindle Automatics up to 1¼in.—HARRADINE AUTOMATICS, Forge Works, Pleasant Place, Hersham, Surrey. 'Phone: W-on-T 24914.

Gear Cutting, Auto Turret, Capstan and Centre Lathe Turning, Milling, Planing, Hardening and Grinding, Profile Cutting and Welding.
SMITH & NETHERWOOD, LTD.
Tanyard Road, Quarmby, HUDDERSFIELD.
Phone: MILNSBRIDGE 1865.

Automatic Capacity Available on Index single spindle autos, up to 2¼in. dia. —ARTHURS ENGINEERING, LTD., Hersham Trading Estate, Molesey Road, Hersham, Surrey. 'Phone: Walton-on-Thames 21277.

E. R. LATTIMER LTD AID & ARB APPROVED
Offer complete Service for
PRECISION PROFILE MILLING, JIG BORING
CENTRELESS, SURFACE AND UNIVERSAL GRINDING
LIGHT TO MEDIUM COMPONENT MANUFACTURE
TOOL DESIGN & MANUFACTURE
SMALL ASSEMBLIES DIE & MOULD MANUFACTURE
SMALL PRESSURE DIE CASTING IN MAZAK ALLOY TO BS 1004
SUPER PRECISION HYDRAULIC COMPONENTS AND ASSEMBLIES
FOR WHICH WE HAVE HYDRAULIC TESTING EQUIPMENT
SHAKESPEARE STREET SOUTHPORT
Phone: 57696/7

THE FIRM WITH HALF A DOZEN JIG BORERS for PRESS TOOLS etc.

HIGH SPEED SERVICE TOOL CO. LTD.
Hayle Road, Surbiton, Surrey. Elmbridge 1126-0-2.
24 HOUR PLOUGH GRINDING SERVICE.

RESEARCH
ENGINEERS LTD.
FOR
SUPER ACCURATE CAMS
BROCHURE AVAILABLE.
ORSMAN ROAD SHOREDITCH LONDON N.1
Telephone: SHOreditch 7811 *Telegrams: WILMAKET, LONDON, N.1*

SUB-MINIATURE PRESSINGS
and multi-stage precision presswork in all materials
PROMPT DELIVERIES
G. A. PRECISION PRODUCTS LTD.
No. 2 Factory Darkes Lane, Potters Bar, Middlesex
Potters Bar 6895.

Pressings and Stampings, Ltd., Eccleston Road, West Ealing, W.13. Presswork up to 130 tons. Double action deep drawing guillotine 3ft. by 10 s.w.g. Spot-welding. Assembly. Toolmaking and electro-plating.—'Phone: Ealing 3667-8

Pressings in all Metals up to 60 tons. Press tools manufactured in our own toolroom. Light assemblies. Domestic Electrical and Mechanical. All finishes. A.I.D. and A.R.B. approved. Advice and estimate given free. Inquiries to:—
METAL COMPONENTS, LTD.,
Dolphin Road, Shoreham-by-Sea, Sussex.
'Phone: Shoreham-by-Sea 2224/5.

CAPACITY AVAILABLE
Send us your Enquiries for
MACHINED REPETITION PRODUCTS
PRECISION TURNED PARTS
Machined Components for all Industries
GENERAL ENGINEERING AND MANUFACTURING
WELDING FABRICATION
A.I.D., A.R.B.
S. M. STUART-TURNER LTD.
VICTORIA WAY, BURGESS HILL
SUSSEX
TEL: BURGESS HILL 85701 (P.B.X.)

•PRESS WORK•
RELIABLE SERVICE · COMPETITIVE PRICES · A.I.D. APPROVED

PRESS WORK
INCLUDING DEEP DRAWING, WELDING AND SUB-ASSEMBLY
to any tolerance, shape or quantity
ECONOMIC STAMPINGS LTD., DISRAELI ST. LEICESTER Tel: 32233

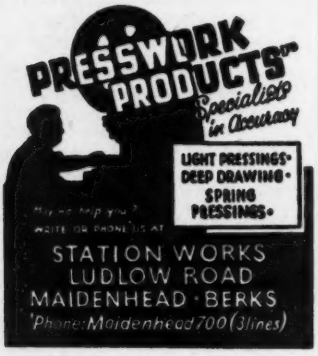
Capacity Turning, Centre Lathe, Capstan, etc.—WILBAR ENGINEERING CO., 97, Queens Road, Nuneaton. 'Phone 4863.

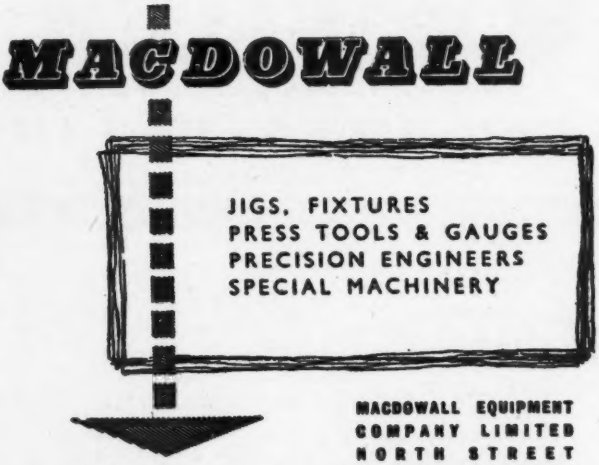
Centreless Grinding Capacity, Infeed Plunge ¼in. to 4in.—CHISWICK ENG'G., LTD., Pluckington Place, Southall, Middx. Tel.: Southall 2247.

Capacity Available, Autos, Millers, Presses, Light Assemblies, Press Tools, Fixtures, etc.—BOX D191, MACHINERY, Clifton House, Euston Road, N.W.1.

PRESS PRODUCTION
AUTOMATIC OR MANUAL OPERATION
UP TO 40 TON USING CUSTOMER OR OUR TOOLING
SUMMERSBY ROAD, LONDON, N.6. TUD. 9851/2/3
GAUGES & INSTRUMENTS LTD.
A.I.D. APPROVED

Classified Advertisements (*CONTRACT WORK, contd.*)





WE DESIGN
AND MANUFACTURE
PRESS TOOLS
AND DO THE
PRESS WORK
A.I.D. & A.R.B. APPROVED
NAISH BROS. & CO. LTD.
KNAPPS LANE, ST. GEORGE,
BRISTOL 5. Tel: 657204/5

TOOLMAKING

Classified Advertisements (CONTRACT WORK, contd.)

COVENTRY GRINDERS LTD

AID, ARB Approved Phone 73344

Send us your enquiries for

GAUGES, FORM TOOLS, DIES, PROTOTYPE, COMPONENTS, MANDRELS, CRUSHERS, JIGS, GEAR CUTTING, OPTICAL FORM GRINDING, CENTRELESS INTERNAL, EXTERNAL, SURFACE.

ALL SIZES OF PRECISION GROUND GAUGEPLATE IN STOCK

$\frac{1}{32}$ to 18in. WIDE

$\frac{1}{32}$ to 1¼in. THICK

18in. to 48in. LONG.

JIG BORING

ON SIP JIG BORERS

EDMONTON TOOL & ENG. CO. LTD

141, HERTFORD ROAD, EDMONTON N.9

TELEPHONE: EDMONTON 4412/3

SPURS, SPIRALS, BEVELS, WORMS & WORMWHEELS

GEAR CUTTING

EST. 1945

R. STEPHENS & SON LTD

PRESS TOOLS · JIGS FIXTURES · MOULDS GAUGES · DESIGNS

115 CHURCH ROAD MYER HEDWOOD LONDON S.E.25

PHONE LIVingstone 2264

Tungsten Carbide Tool

Manufacturers of standard and special form tools in high speed steel and tungsten carbide. Our range includes reamers, cutters, work rest blades and wear-resistant parts.

Carbide supplied to customers specifications and express service given for emergency tooling.

DIAGRIT GRINDING CO., LTD., Station Road, Staplehurst, Tonbridge, Kent. 'Phone: Staplehurst 449.

Press Tools, Press Work, Capstan

Turning and General Machining. Components manufactured and assembled to specifications.—L. PERSON & SON, 68, Shaftesbury Street, London, N.1. CLE. 7139.

Heycon Plug Gauges in tool

Steel or Solid Tungsten Carbide to B.S.1044/969. Quick delivery. Price list on application. Specials quoted on by return.—H. E. (INSTRUMENTS), LTD., 239/241, Gipsy Road, S.E.27. Tel.: Gipsy Hill 6135.

SPECIALITIES

Z B. AUTOGRIP MILLING FIXTURE

FOR QUICKER MILLING OF ROUND COMPONENTS

- Wide range.
- 1" Dia. to 2" Dia.
- Low cost—Highest production.
- Stock or early delivery.
- Change from one run to another in minutes.
- Replaces hundreds of special fixtures.
- "In line" milling for efficiency.
- Diameter variation does not matter.
- Three point secure gripping.

AUTOMATICALLY COMPENSATES FOR VARIATIONS IN DIAMETERS

A VITAL "MUST"

Z. BRIERLEY LTD ENGINEERS TOOLS & SUPPLIES

Write for illustrated brochure NOW to:—

QUEENS ROAD WORKS LLANDUDNO N. WALES Phone 76970

AUTOMATIC NUMBERING MACHINES for MARKING ALL TYPES OF METALS

Phone GERrard 5051

ARCHER ST. WORKS ARCHER STREET SHAFTESBURY AVE LONDON W.1.

A.E.GALE LTD

Step-Drills and Counterbores, up to 1¼in. diam. cut from stock sizes. 5-day delivery.—DRILL SERVICE (HORLEY) LTD., 89, Albert Road, Horley, Surrey, Horley 4406.

The "Coxeter" Revolving Centre from 70s. All sizes from stock.—REVOLVING CENTRES, LTD., Oxford.

TIME RECORDERS—Sales— Rental Service; Tel. Hop. 2239.

TIME RECORDER SUPPLY & MAINTENANCE CO., LTD., 157/159, Borough High Street, London, S.E.1

BALL & ROLLER BEARINGS

THE WORLD'S LARGEST SELECTION OF

BRITISH, AMERICAN AND CONTINENTAL BEARINGS IN ALL TYPES AND SIZES

IMMEDIATE DELIVERY FROM STOCK · KEENEST PRICES

CLAUDE RYE BEARINGS

895-921 FULHAM ROAD · LONDON · SW6

PHONE: RENOWN 6174 (Ext. 24) TELEX 23453 CABLES: RYE BEARINGS, LONDON

Slough Branch: 80 BATH ROAD, SLOUGH Phone: SLOUGH 22354

Kingston Branch: 88 LONDON ROAD, KINGSTON Phone: KINGSTON 6755 & 4142

Complete Box Banding Equipments, comprising machine, coil-holder strapping and seals, can be supplied in the following sizes:— $\frac{5}{16}$in. $\frac{3}{4}$in. $\frac{1}{2}$in. $\frac{3}{4}$in. $\frac{1}{4}$in. 1in. 1$\frac{1}{4}$in. & 1$\frac{1}{2}$in.

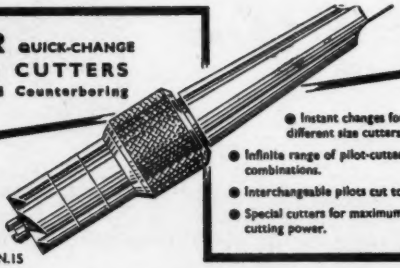
TAPERLOCK & TRILOCK GAUGE HANDLES & BLANKS

Engraving Service Complying to B.S. 1044

Handles produced from aluminium material, anodised in various colours. Special length handles for deep bores. Blanks manufactured in cast steel hardened throughout tapers ground to size.

BRILHART LTD - HATFIELD - DONCASTER Tel.: Hatfield Woodhouse 202

ED-GAR QUICK-CHANGE
HOLDERS & CUTTERS
for Spotfacing and Counterboring



- Instant changes for different size cutters.
- Infinite range of pilot-cutter combinations.
- Interchangeable pilots cut tool costs.
- Special cutters for maximum cutting power.

Sole manufacturers —
E.M.C. ENGINEERING CO. (LONDON) LTD.
SOUTHEY WORKS,
SOUTHEY ROAD, LONDON N.15

ABOUT AMMUNITION BOXES
THOUSANDS OF STEEL AND WOODEN BOXES OF ALL SIZES
Ideal for all Types of Packing & Storage purposes.
For particulars and prices apply:—
O.K. TRADING (B'HAM FACTORS) LTD.
78-84, MOAT LANE, B'HAM 26
STEchford 4351/2 P.B.X.

'WORTH' PIPE UNIONS
for Steam, Water, Oil or Gas.
NEVER LEAK
WALTER SLINGSBY & CO., LTD.
WASK WORKS KEIGHLEY

"Albion"
INDUSTRIAL COUNTING INSTRUMENTS & MEASURING MACHINES

Patented in principal countries

Ratchet and Revolution Counters of all descriptions. A Catalogue or a visit by our technical representative on your request.

"INSTRUMENT DIVISION"
B. & F. CARTER & CO. LTD.
ALBION WORKS, BOLTON 19, ENGLAND
TEL: BOLTON 23344 ALL LINES
GRAMS: BRAIDERS, BOLTON

CIRCLIPS
all types from stock
ELLISON SPRING CLIPS LTD., BINGLEY YKS.
Tel: GUILLINGWORTH 8836/7

Universal Ball Bearing Co.
111-115 Hammersmith Grove, London, W.6
FACTORS MANUFACTURERS AND REPAIRERS
Phone: Riverside 3261-2-3-4 Grams: "Universal Bearing Hammersmith"

ANNOUNCEMENTS

•WORK TO PLACE•

Large Engineering Company in London wishes to sub-contract work in the following capacities. Medium Capstan, Turret Lathes, Vertical and Horizontal Boring, Medium and Large Planing, Milling, Radial Drilling, Grinding, Centre Lathes, etc.—Please send particulars of plant to BOX C715, MACHINERY, Clifton House, Euston Road, N.W.1.

PHOTOGRAPHY

Miles & Kaye, Ltd., 102, Southampton Row, London, W.C.1. Holborn 6858. Specialists in commercial and industrial photography for over 60 years. All branches of photographic work undertaken.

Photographs by MACHINERY set the standard in engineering publicity. Our studio is one of the best equipped in the country. Ideal for really good photography of tools, attachments and portable equipment. Mobile units available for taking photographs in black and white or in natural colour in your own or your customers' works. Specimens of work submitted on request.—Full particulars from the SERVICE MANAGER, MACHINERY PUBLISHING COMPANY, LTD., National House, West Street Brighton, 1.

PACKING AND SHIPPING

R. & J. PARK, LTD., Dominion Works, Chiswick, England. Export packers, shippers, and forwarding agents. Specialists in packing heavy machinery.

AGENCIES

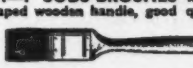
British Company (Small) already representing a German Company, wish to increase the representation, preferably with machine tools and small tools. Inspection equipment welcome also. British and European equipment welcome also. Would consider manufacture of selected items if required.—BOX D168, MACHINERY, Clifton House, Euston Road, N.W.1.

BUSINESS FOR SALE

Engineers Tool Merchants. Largest in East Midlands City. Six figure turnover, rising steadily. Ample scope for further increase. For sale as going concern. Directors and Staff to remain. Managing Director wishes to retire in three years maximum. Principals only.—BOX D196, MACHINERY, Clifton House, Euston Road, N.W.1.

MISCELLANEOUS FOR SALE

PII—1" SUDS BRUSHES with smooth shaped wooden handle, good quality, new



9½" O/A 2⅜" Visible Bristle ⅞" thick
16/- per dozen, 192/- per gross. Post Paid.
WM. HURLOCK JNR. LTD. (Estab. 1904)
5-7 Kingston Hill, Kingston-on-Thames Surrey. KIN 4526-7-8

MATERIALS FOR SALE

Storage Bins, 18in. × 10in. × 5in. deep 3s., Pressed Steel Shelves 4ft. 6½in. × 9½in. × 16 gauge 2s. 6d. Good condition.—LOWTON METALS, LTD., Sandy Lane, Lowton St. Mary's, Leigh 71441/2.

Brass Tube 1⅛in. o.d. 16g and 1⅛in. o.d. 18g Surplus to requirements. 3s. per lb. to clear.—BERmondsey 2883.

MATERIALS WANTED

£200,000
AVAILABLE FOR THE PURCHASE OF
NEW BALL & ROLLER
BEARINGS
OF ALL TYPES & SIZES
BY BRITAINS BIGGEST BUYERS
CLAUDE RYE BEARINGS
895-921 FULHAM RD. LONDON SW6
RENOWN 6174 (Ext 24) TELEX 23453

PLANT WANTED

M.R.E. Double Headed Centring machine.—BOX D152, MACHINERY, Clifton House, Euston Road, N.W.1.

A. LAWRENCE & CO. (MACHINE TOOLS) LTD.
will be pleased to purchase your surplus Modern Machine Tools either on a cash or part exchange basis. Ask our representative to call and inspect.
Welsh Harp, Edgware Road, London, N.W.2
Telephone: GLAdstone 0033

WANTED
WE STILL WANT TO BUY A NUMBER OF THE OLDER TYPE OF SS & SC LATHES 8¼in. CENTRE HEIGHT AND ABOVE. MUST HAVE GAP BEDS AND HOLLOW SPINDLES AND NORTON TYPE BOX AN ADVANTAGE. SINGLE PULLEY DRIVE PREFERRED BUT CONE DRIVE IN GOOD CONDITION ACCEPTABLE.
ALSO BELT DRIVEN RADIAL DRILLS AND SHAPING MACHINES.
J. E. RAISTRICK LIMITED,
Reliance Works, Poyle Trading Estate,
COLNBROOK. SLOUGH. BUCKS.
Tel: Colnbrook 2421

WANTED!
REINECKER Universal Relieving Lathes Model UHD. I.
BOX D143 MACHINERY
Clifton House, Euston Rd., N.W.1.

Power Presses, Power Guillotines, Sheet Metal Machinery, urgently required.—STANCROFT, LIMITED, Lancaster St., Birmingham. 4. Aston Cross 3741 or 2235.

Wanted, Twist Drill Grinder, No. 3 Herbert Hunt or similar make, must be in first class condition. Motorised 400/440/3 phase.—EDWIN MILLEN & SONS, LTD., 70, Clerkenwell Road, E.C.1. 'Phone: CLErkenwell 3602 and 6064.

HIGHEST PRICES PAID FOR.....
MACHINE TOOLS • PRESSES • PLATE & SHEET METAL WORKING MACHINERY • TIN BOX MAKING MACHINERY • WOODWORKING MACHINERY
Outright purchase or in part exchange
F. J. Edwards Ltd
EDWARDS HOUSE, 359-361, EUSTON RD., LONDON, N.W.1
Telephone: Euston 5000 Telex 24264
41, WATER STREET, BIRMINGHAM 3 Telephone CENtral 7606-8

WE ARE KEEN BUYERS OF GOOD MODERN MACHINE TOOLS. INSPECTION WILL BE ARRANGED AT ONCE.

M. C. LAYTON LTD.

Abbey Wharf,
MOUNT PLEASANT
ALPERTON, MIDDLESEX

Telephone: WEMbley 9641-8

WE WILL PURCHASE Modern quality Machine Tools for cash. Whole plants or individual items. Full details to —

HARRY KIRK ENGINEERING, LTD., Machine Tool Division, Brandon Road Works, Brandon Road, Coventry. Telephone: Walsgrave-on-Sowe 2253/6.

Wanted Urgently

Late Type Machine Tools

Best Prices are offered for latest types of Machine Tools. Send us details of what you have and our representative will call to inspect.

J. B. MACHINE TOOL CO. LTD.
312 BRADFORD ST., BIRMINGHAM 5
Telephone: MIDland 4375

WANTED GOOD MACHINE TOOLS

Offer your Surplus Tools to us. We pay a good price.

M. WARD
(MACHINE TOOLS) LTD.
1, KILBURN HIGH ROAD, LONDON, N.W.6.

Telegrams: Emwarneers, Kilb, London.
One minute from Kilburn Park Station, Bakerloo Railway.

Selling Machine Tools?

You get the RIGHT price from...

GATE

SPECIAL REQUIREMENTS

HEAVY DUTY MACHINES

GATE MACHINERY CO. LTD
172-178 Victoria Road, Acton, London, W.3
Tel: Acorn 8881/2 (7 lines) Telex: 21111

WANTED

Good Class Used
MACHINE TOOLS

Write or phone

STANCROFT LTD.
BEDWORTH ROAD, COVENTRY
Telephone: Coventry 88072

Machine Tools, Power Presses, and Sheet Metal Machinery. Single machine or complete plant purchased. Immediate Inspection.—ALBERT EDWARDS (MACHINERY), LTD., 79/89, Pentonville Road, London, N.1.

WANTED!

GOOD CLASS MACHINE TOOLS POWER PRESSES & SHEET METAL MACHINERY

EDWIN MILLEN & SONS LTD.
70 Clerkenwell Road, London E.C. 1
'Phone: CLErkenwell 6064

WANTED

All types of modern

MACHINE TOOLS

Chipping Sodbury 3311

NEWMAN INDUSTRIES LIMITED
YATE · BRISTOL

Wanted, Brown & Sharpe and C.V.A.8 Single Spindle Automatic.—MELBOURNE ENGINEERING CO., LTD. Melbourne, Derbyshire. 'Phone: Melbourne 232.

SURPLUS MACHINE TOOLS REQUIRED

OFFER YOUR MACHINES TO

J. E. RAISTRICK LTD.

POYLE TRADING ESTATE
COLNBROOK, SLOUGH, BUCKS.

TEL: COLNBROOK 2421

EXTRA

GOOD PRICES

offered for quality second-hand

MACHINE TOOLS

Inspection arranged quickly

Modern Machine Tools Ltd.,
P.O. BOX 54, GOSFORD ST., COVENTRY.
Telephone: Coventry 22132/6

Classified Advertisements (*PLANT WANTED, contd.*)

WANTED
MODERN MACHINE TOOLS

We pay cash for single machines or complete plants

SEND US DETAILS
IMMEDIATE INSPECTION ARRANGED

SOUTHERN ENGINEERING AND MACHINERY CO.
CONNAUGHT BUILDINGS, TANNERS BROOK, MILLBROOK, SOUTHAMPTON
Telephone: Southampton 73101/2/3

---

k·e·n·t
Give Value

WHETHER BUYING OR SELLING
USED MACHINE TOOLS
Contact:—
K.E.N.T. MACHINERY & ENG. CO.,
Datchelor Place Mews, London, S.E.5.
Telephone: ROD 4149.

CENTAUR TOOL WORKS
Birmingham, 18, pay best prices for good modern secondhand Machine Tools by first-class makers. Write or phone and our representative will call.—'Phone EDGBASTON 1118 and 1119. 'Grams: Capstan, Birmingham.

Longford Machine Tool Co., Ltd.,
Longford Road, Coventry, will pay good prices for any type of machine tool which is in good condition, and is of first class make. Only machines motorised 400/3/50 will be considered. —Write or 'phone Coventry 87481/2.

B.G. MACHINERY, LTD.,
Montgomery Street, Sparkbrook, Birmingham, 11, will pay good prices for Machine Tools of first-class make and in good condition. 'Phone VICtoria 2351/9.

The Following Secondhand
Machine Tools of recent Manufacture are required; please quote age, condition and price or alternative offers to:—Mr. R. Reynolds, ACROW (ENGINEERS), LTD., Tower Works, Saffron Walden, Essex.
Slot Miller or Keyseater—Karl Hurth L.F.4.
Table 48in. × 12in.
Turret Lathe—Herbert No. 2 Pre-Optive.
Milling Machine—Cincinnati Plain Hypowermatic—3-36 table, 18in. × 60in.
Horizontal Borer—No. 2 Kearns Patent, 3in. travelling spindle.
Universal Grinder—Churchill P.A.W. 10in. × 24in.
Horizontal Surface Grinder—Snow O.S., 24in. × 8in.
Vertical Surface Grinder—Snow V.18, 72in. × 15in. or 42in. × 15in.
Shaper—Butler 26in. Universal Table.
Pillar Drill—High Speed, 1in. capacity.
Multi-spindle Drill—12in. adjustable spindle, ¾in. or ½in. capacity.
Vibrator—Walther Trowal TA1-150 Deburring Machine.
Furnace—Toolroom Type.
Flame Cutters—B.O.C. Type 4019.
JOSEPH RHODES PRESSES:—
250 ton Friction Screw.
150 ton double sided single geared—friction clutch drive, 72in. between sides.
35 ton open fronted inclinable, direct drive V.S.
45 ton open fronted inclinable, direct drive V.S.
60 ton open fronted inclinable, direct drive V.S.

WANTED!
USED MACHINE TOOLS
We offer generous prices for your plant or accept in part exchange for modern equipment

E·H·JONES
(MACHINE TOOLS) LTD
48, HIGH STREET, EDGWARE
Telephone: EDGware 4488
Midland 5593 - Birmingham

CYLINDRICAL GRINDING MACHINE. Minimum capacity 12in. × 72in., with variable speed workhead motor, quick approach and return mechanism to the Wheelhead, and variable Hydraulic table traverse. Capable of producing high quality surface finish and precision sizing. Required for advertiser's own use.—BOX D180, MACHINERY, Clifton House, Euston Road, N.W.1.

Albert Edwards
(MACHINERY) LTD.,
79/89 PENTONVILLE ROAD
LONDON, N.1.
Telephone: TERminus 0167/8/9

We are buyers of good modern machine tools

Modern Good Class Machine
Tools and Sheet Metal Machinery required for prompt cash.—H. BELL (MACHINE TOOLS) LTD., Walter Street, Leeds, 4. Tel. 63-7398.

Lumsden No. 70 LE Grinder
with 24in. dia., table required. Must be in first-class condition.—C.I.C. ENGINEERING LTD., Excalibur Works, Shepton Mallet, Somerset.

Urgently Required.
Covel Horizontal Spindle Surface Grinder, Size 24in. × 6in. Type 78. This size and model only. Please state Serial number.
Wotan-Zimmermann Horizontal Spindle Surface Grinder. 2ft. 7in. × 10in. Please state age and Serial number. This model only.
THOMPSON MACHINE TOOLS LTD.,
Salmon Pastures Works,
270, Attercliffe Road,
Sheffield 4.

Wanted, Secondhand Surface
Plates near 24in. × 18in.
10in. or 12in. English scale height gauges. Small Vee blocks and angle plates.
SPENCER BAYLEY LTD.,
Pennington, Lymington, Hants.

Horizontal and Vertical Diesel
Engines and Generating Sets wanted for export.—Full details, please, to VIZARD, 39, Essex Road, Leicester. 'Phone: 68837.

PLANT FOR SALE

HENRY BUTCHER & CO.
Specialists in the
• VALUATION AND SALE OF FACTORIES, PLANT AND MACHINERY •
73 CHANCERY LANE, LONDON, W.C.2
TEL.: HOLBORN 8411 (8 lines) GRAMS: PENETRANCY, HOLB., LONDON

Classified Advertisements (*PLANT FOR SALE, contd.*)

RING BELLS *for machine tools*
LEEDS 63-7398

A Good Number of High-class Machine Tools always in stock. At ELLISON (SALFORD), LTD., Cook Street, off Chapel Street, Salford, 3, Lancs.

NEW MACHINES EX-STOCK

"Q. & S" 10B Standard Horizontal Bandsaw.
STARTRITE Sabre Bandsaw.
TRIANGLE 15 kVA Spot Welder.
SAMAND TG. 8in. Double-Ended Precision Grinders.
DAVID DOWLING Tool and Cutter Grinder, and Engravers Models 848 and 713.
Compressed Air Units—B.E.N., VR10, VR32, PD7, Handispray.

R. KELLY & SONS LTD.
LIVERPOOL—ROY. 4463.

12½in. Centre "Swift" 16ft. 6in. b.c. heavy duty m/d all-gd.' hollow spindle S.S. & S.C. Lathe, with two saddles each with taper turning attachments. 20 H.P. 400/3/50 motor, 18 spindle speeds 1.5–91 r.p.m. Spindle mounted in 'Timken' roller bearings.—LEE & HUNT, LTD., Crocus Street, Nottingham. Phone 84246.

Bullard Verticalauto, D-type, 8- spindle 16/23, double indexing. Complete with compound slides and chucks.—HENRY KIRK (MACHINE TOOLS), LTD., Yate, Bristol. Tel. Chipping Sodbury 3081.

Two Lorenz SOO High Speed Shapers. Max. dia. 7in. × 2¼in. stroke Fully motorised. Just rebuilt. £650 each ex works.—ROLLS TOOLS LTD., Pyrford Road, Pyrford, Woking, Surrey. (Byfleet 43252.)

35ft. Redman Planing Machine, Ward-Leonard AC/DC drive, complete with switchgear.—BOX D154, MACHINERY, Clifton House, Euston Road, N.W.1.

625 Ton Hydraulic Deep Draw- ing Press by Fielding & Platt, punch power 510 tons, blankholder 115 tons, 72in. × 63in., bottom cushion, self-contained pumping unit, with automatic and manual control.
200 ton Open-fronted Straightening Press by H.E.C., table 3ft. × 3ft.
Many other Hydraulic Presses for all duties.
REED BROTHERS (ENGINEERING) LTD., Mr. C. E. M. Hardie — Receiver and Manager, Replant Works, Woolwich Industrial Estate, London, S.E.18.
Tel.: Woolwich 7611.

Choose from

HUNDREDS of
SHEET METAL MACHINES

at the

FJE MACHINE CENTRE

Islington Park Street, London N.1.
(on the A1, near Highbury Corner)

Cash or monthly account, hire purchase, or by the FJE Machine Hire Plan

F. J. EDWARDS LIMITED
359-361 Euston Rd. London N.W.1

Surface Grinder, New Harbot 18in. × 6in. hand traverse, £550. Also New Fortis Lathe, 6ft. centres, £526. Both motorised 3 phase.

LISTER TOOLS, LIMITED,
35/37, Wednesfield Road, Wolverhampton.
Telephone 25363.

2 off.
NEW FREDK. POLLARD Model 12MXT CORONA
Adjustable Multi-Spindle Column Drilling & Tapping Machines complete with 12 off (6 per machine) No. 1 Adjustable Spindle Bracket Assemblies and Coolant Equipment

Box D190
MACHINERY, Clifton House, Euston Rd., N.W.1

Micromatic "Hydrohoner" Hydraulic Honer, Model H1. Auto cycle. Table 11¼in. × 10in. W/S. Ind. motors. —WILCOX & CO., Barr Street, Birmingham 19. NORthern 1234/5.

WIDDOWSONS

NAVALMECCANICA
13ft. by 5ft. by 4ft. Planing Machine,
three tool boxes, brand new
ex manufacturer. Quick delivery.

'UNION' BFT. 63
Horizontal Boring and Facing
Machine, 2½in. dia. spindle,
Speeds 4 to 1,400 r.p.m.

ARCHDALE
5ft. Heavy Duty Low Base
Radial Drilling Machine.
Nearly New

KENDALL & GENT.
Plano Milling Machine,
with Vertical Head,
4ft. by 4ft. by 4ft. long,
Speeds 12 to 700 r.p.m.

HERBERT WIDDOWSON & SONS LIMITED

Canal Street Works, Nottingham · Telephone : 51891 (4 lines)

MEMBER OF B.A.M.T.M.

FRYE MACHINE TOOL COMPANY LIMITED

offer good class plant

POYLE ROAD · COLNBROOK · SLOUGH · BUCKS · *COLNBROOK 2442/3/4*

NEAR TO LONDON AIRPORT

Latest additions to our American Stocks.

MICHIGAN 8in. Universal Rotary Gear Shaver, No. 870A, 1952.
GLEASON 7A Hypoid Generator, Serial No. 20296.
LANDIS No. 2 Race-A-Way Oscillating Radius Grinder, 1953.
MICROMATIC No. 723 Honing Machine, 1953.
GLEASON No. 7 Hypoid Gear Grinder, 1940. Excellent Condition.
NEWARK No. 5 Universal Gear Hobber, 32in. and 72in., 1944.
ACME GRIDLEY 1in. 6-sp. Automatic, 1947.

Send for details from:—

K & C MACHINERY LTD.
Stephen Street, COVENTRY. 23669.

Van Norman Radius Grinder. To take 2in. dia. × 1in. wide components. Continuous feed model. Ind. motors.—WILCOX & CO., Barr Street, Birmingham 19. Northern 1234/5.

NEWALL USED MACHINE DIVISION

HAVE AVAILABLE FOR EARLY DELIVERY

NEWALL / KEIGHLEY 'L' 12 by 24 External Grinder, complete with built in Wheel Dressing Compensating Valve.

MILWAUKEE Vertical Milling Machine, Model 'H' 5ft. 3in. by 1ft. 3in.

HEALD 72A Internal Grinder.

NEWALL 836 Thread Grinder.

NEWALL 10-U Lapping Machine.

No. 16 **BLANCHARD** Surface Grinder.

All ex used stock

THE
NEWALL
USED MACHINE DIVISION
OUNDLE ROAD
ORTON LONGUEVILLE
PETERBOROUGH

Telephone: Peterborough 67116/7

17-ROLLER PLATE STRAIGHTENING OR PROCESSOR LEVELLING MACHINE BY HEAD WRIGHTSON

FOR SALE

For rectifying mild steel sheet having a yield point not exceeding 20 tons p.s.i. in widths up to 96in. and up to 16 S.W.G. Two brushes and two paraffin sprays. 57 backing-up rollers.
Motor drive, 50 h.p. 400/440/3/50.
Weight about 20 tons. Floor space 18ft. by 9ft.

F. J. EDWARDS LTD.

359, Euston Road, London, N.W.1.
Euston 5000 or
41, Water Street, Birmingham 3,
Central 7606.

Siemens Schuckert Electrically

Heated Furnace, 6ft. 10in. dia., 8ft. 10in. deep, 550 deg. C., 100 kW, 400 volts.
New Process 100 kV Seam Welder, 400/3/50.
British Federal 50 kVA Flash Butt Welding Machine. 400/3/50.
Fielding 50 ton hydraulic horizontal pipe bender, up to 6in. bore hydraulic tubes.
200 Ton Fielding Downstroke Hydraulic Press, 14in ram, 42in. stroke, 63in. daylight.
100 Ton Fielding ditto 10in. ram, 72in. stroke, 99in. daylight.
50 Ton Fielding ditto, 3ft. stroke.
Bliss 70 Ton Geared Double Sided Power Press. 400/3/50 supply.
3 Bliss No. 304 Vertical Single Action Drawing Presses, 7½in. stroke, 50 tons. American.
Bennie Punching, Shearing and Section Cropping Machine, 4½in. × 4½in. × ½in. angle.
Windsor 6-oz. Plastic Injection Moulding Machine.
Sedgewick Bending and Folding Machine, 6ft. × ½in., motorised.
8ft. × ½in. Bennie Bending Rolls.
7ft. × 1in. Craig Donald Flattening Rolls.
"Pyramid" Bending Rolls, 9ft. 0in. × ½in.
200 Tons Tangye Hydraulic Straightening Press, bed 25ft. × 3ft., stroke 21in., motorised travelling table, 2 ram pump.
Hugh Smith Double Table Scarfing Machine, 13in. fixed stroke, from 16in. to 8ft. wide, 1½in. thick steel plates.
Crow, Harvey Punch, Shears and Angle Cropper, 18in. blade, 27in. throat, heavy duty.
Pels Punch Shears and Cropper, 12in. blade, shear ½in. takes 6in. × 6in. × ½in. angles.
Robertson Shears, ½in. capacity, 10 h.p. 28in. blade, 9in. maximum opening. (Two.)
Berry Plate Guillotine, capacity 4ft. × 1in. 18in. throat, 30 h.p. motor.
New 1-cwt. and 2-cwt. Hammers by Massey and Alldays & Onions, also 3-5-cwt. secondhand E.O.T. Cranes.
30 Ton Marshall Fleming, 29ft. span, cab control.
25 Ton Clyde, 21ft. 9in. span, cab control 1954. Can convert any span to 95ft.
20 Ton Vaughan 42ft. 3in. span. Unused.
20 Ton Morris Goliath, 35ft. span, 5 ton auxiliary.
10 Ton Heywood, 34ft. span. Unused.
10 Ton Morris 32ft. 10in. span, cab control
10 Ton, 60ft. span. 1955. (Two.)
5 Ton, 37ft. span. 1944.
3 Ton Morris, 149ft. span. 1954.

FRED WATKINS (ENGINEERING), LTD., Coleford, Glos. 'Phone: Coleford 2271 (5 lines).

New KERRY Model A.G.2 5½in. Gap Bed Centre Lathe, Cabinet Model. Immediate delivery.
Further details and full quotation from:
C. & G. OLDFIELD, LTD.,
15, Abercorn Street,
PAISLEY.

ACBARS

AVAILABLE FROM STOCK

AUTOMATICS

B.S.A. Acme Gridley ¾in. 6 spindle. Rebuilt machine.
CONOMATIC 1¼in. 4 and 6 spindle. Rebuilt machines.
RYDERMATIC No. 12 Vertical Multi-Tool Lathe.

BORER

KEARNS No. 1 Patent.

BROACH

FORST RIAS Universal Vertical Broach for internal and surface broaching. 5 tons, 39½in. stroke. 1952 machine.

GRINDERS

SNOW vertical spindle, rotary table. 10in. dia. cup wheel, 24in. dia. elec. chuck.
BROWN & SHARPE No. 2 Surface.
New ALPA Surface, 32 × 8in.
ABRASIVE 3B Surface.
JUNG AS Internal.
KEIGHLEY Type XL Hydraulic Plain Grinder, 6in. × 18in.
CHURCHILL 10in. × 24in. Universal.
LANDIS 12 × 48 Universal.
BROWN & SHARPE No. 3 Universal.
NORTON 14in. × 36in. Universal.

CAPSTAN AND TURRET LATHES

MURAD 3Q ¾in. Capstan.
HERBERT 2S Bar Feed Capstan.
GISHOLT No. 5 Bar Feed Capstan.
LEICHTI PR Turret Lathe (Swiss).
GISHOLT Turret Lathes.
FOSTER No. 2B Turret Lathe.

CENTRE LATHES

HENDEY 6in. × 30in. Taper Turning.
MONDIALE 7in. × 60in. Gap Bed.
CROMWELL 3½in. Precision.

MILLERS

HERBERT No. 1 Hand Lever. Rebuilt.
ADCOCK & SHIPLEY Model OA with "Multiform" Auto. feed. Rebuilt.
WERNER No. 5160 Small Multipurpose. Vert. and Horiz. Table 22in. × 6½in.
ARCHDALE 14in. Manufacturing type.
CINCINNATI Type OK 18in. Horiz.
EDGWICK 18in. Horizontal.
ARCHDALE 20in. Twin Overarm Horizontal. Table 40in. × 10in.
KENT-OWENS 1-8 and 1-14 Hydraulic Production.
OLIVETTI FP2 Production—Unused.
CINCINNATI 4-36 Duplex Hydromatic
New TAYLOR Vertical, table 17½in. 54½in.
HERBERT 23V Vert. Table 68in. × 17in. 48in. traverse.
HELLER Automatic Thread Millers (4).
ASQUITH HKO Duplex Keyseater.

PRESS

V. & O. No. 11 Double Action. Approx. 10 tons. Roll feed. Max. draw 1in.

All machines motorised 400/3/50 unless otherwise stated.

ACBARS LIMITED,
331-3, WALWORTH ROAD, LONDON, S.E.17.

Telephone: RODney 7822.
Telegrams: Acfirb London S.E.17.

S·V

New & Used Machine Tools

CENTRE LATHES

COLCHESTER "Triumph" 7in. Gap Bed Centre Lathe.
SOUTHBEND 16in. swing, 6ft. 6in. between.

AUTOMATIC AND CAPSTAN LATHES

DRUMMOND Model K Chucker.
PETERMAN Model HS10.

MILLING MACHINES

VICTORIA Model M1, Hori. Mill.
ARCHDALE Hori. Mill, 38in. × 10in. table.
T.T.H. 3 Dimensional Pantograph Milling and Diesinking Machine.

GRINDING MACHINES

KAESER Hydraulic Surface Grinder, cap. 24in. × 8in., with mag. chuck, etc.
CHURCHILL No. 1 Planetary Cylinder Grinder.
CHURCHILL 6in. × 20in. Hydraulic Plain Cylindrical Grinder.

PRESSES

HUMPHRIS 80 ton open fronted inclinable, adjustable stroke.
New **RATZER** 12 ton Power Press, adj. str.
SWEENEY & BLOCKSIDGE No. 6 Detachable Arm Flypress.

MISCELLANEOUS

QUALTERS & SMITH 6in. Hacksaw.
RHODES 6ft. 6in. × ¼in. Heavy Duty Universal Swing Beam Folder.
OSTER Screwing Machine, 2in. gas max.
RICHARDS Horizontal Borer, non-travelling spindle, 32in. facing head, with extension to face about 5ft. dia.

There are many more at

STRAIGHT & VINES LTD.,
MINT STREET, BOROUGH, LONDON, S.E.1
Telephone: HOP 4364

BROWN & SHARPE Model OOG. Single Spindle Automatic.
BUTTERWORTH 1¼in. cap. Single Spindle Automatic.
KELLER Model B.L. Die-Sinking Machine, Table 48in. × 26in., Electronic Controlled.
INVICTA Model 6M. 24in. Stroke Shaping Machine.

NORMAN E. POTTS (MACHINERY) LTD.,
151/154, Sandy Lane, Birmingham, 12.
Tel.: Vic. 1278.

FELLOWS NOS. 61A and 645A3 GEAR SHAPERS, 18in. dia. capacity.
FELLOWS NO. 612 GEAR SHAPER 35in. dia. capacity.

F. J. EDWARDS LTD.,
359-361, EUSTON ROAD, LONDON N.W.1
Telephone: EUSton 5000. Telex No. 24264

And at Lansdowne House, 41, Water Street, Birmingham 3.
Telephone: Central 7606-8.

THE SPOT ● TO WATCH!

FOR GOOD CLASS SECONDHAND MACHINES AT LOW COST

B.S.A. No. 48 Automatic.
C.V.A. No. 8 Automatic.
C.V.A. No. 20 Automatic.
WARD 1A-2A Capstans.
BROWN & SHARPE No. 2 and No. 5 Surface Grinders.
CHURCHILL 18in. by 6in. Surface Grinders.
BROWN & SHARPE No. 1 and No. 2 Uni. Grinders.
STUDER Type 'O' Plain Grinders.
LANDIS No. 1 Universal Grinder.
ATIEFFE Cutter Grinder. A.V.40.
FRITZ WERNER 270A Cyl. Grinder.
PRATT & WHITNEY 16in. by 36in. S.S. & S.C. Lathe.
PRATT & WHITNEY 12in. by 30in. S.S. and S.C. Lathe.
MONARCH Mod. 'C' 12in. by 54in. S.S. and S.C. Lathe.
HARRISON 4½in. Lathe.
SOUTHBEND 14½in. Lathe.
SENTINEL CRIDAN Thread Chasing Lathe (1954).

CINCINNATI 08 Vertical Mill.
K & T No. 5HM Vertical Mill 1,300 r.p.m.
K & T 4H Horiz. Mill.
CENTEC 3R Hor. Mill.
MANN Thread 6ft. B.C. Mill.
SCHULER 20/140 Power Press.
TAYLOR & CHALLEN No. 63 40T Power Press.
ESSEA 6T and 10T Power Presses.
BLISS 18 Power Presses.
SENTINEL 25T Power Presses.
KELLER 1210 Diesinking Machine.
RHODES 10ft. by ¼in. Hydraulic Shear.
RHODES 6ft. by ¼in. Guillotine.
BLISS No. 39 Horning Press.

LATE AMERICAN MACHINES

GLEASON 12in. Str. Bevel Gear Generator.
FELLOWS 61A High Speed Gear Shaper.
GLEASON No. 16 Spiral Bevel Hypoid Gear Generator.
FELLOWS 612 High Speed Gear Shaper.
HEALD No. 22 Ring & Surface Grinder.

All machines motorised 400/3/50 unless otherwise stated.

GOOD USED MACHINE TOOLS WANTED

E. H. JONES
MACHINE TOOLS LTD.
48 HIGH STREET, EDGWARE, MIDDX.
PHONE EDGWARE 4488/9

78, WRENTHAM STREET, BIRMINGHAM 5, *Phone Midland 5593*

HIGH QUALITY USED MACHINE TOOLS

EDGWICK No. 2 Horizontal Plain Milling Machine. Table size 46in. × 11in. 400/3/50.
HERBERT No. 1 Horizontal Milling Machine Table size 26in. × 8¼in. 400/3/50.
ORMEROD 20in. Stroke Heavy Duty Shaping Machine. 400/3/50.
TOWN Shaping Machine. Max. stroke 19in. 400/3/50.
CLIFTON & BAIRD 22in./24in. Mechanical Cold Sawing Machine. Self-contained motor drive, 10 h.p. motor, 400-440/3/50.
Used **PRECIMAX** Type UPJ12/72 Hydraulic Universal Cylindrical Grinding Machine with variable speed workhead and electrics to suit 400/3/50.
HERBERT No. 12 Heavy Duty Combination Turret Lathe. Full chucking equipment. 400/3/50.
TOWN 28in. Vertical Spindle Drilling Machine. Compound table. 400/3/50.
K. & W. 33in. Sensitive Radial Drilling Machine. Swing-aside table, swing-aside arm. 400/3/50.
JONES & SHIPMAN 20in. Vertical Drilling Machine. No. 4 Morse Taper. Power feed. 400/3/50.
KEARNS No. 2 Standard Horizontal Boring Machine with facing head and sliding spindle. 400/3/50.
SNOW T20 Table Surface Grinding Machine.
WE UNDERTAKE REBUILDING OF ALL TYPES OF MACHINE TOOLS

CENTAUR TOOL WORKS,
EYRE STREET, SPRING HILL, BIRMINGHAM, 18.
Tel. EDGbaston 1118 & 1119 'Grams Capstan, Birmingham

NEW MACHINES EX-STOCK

PERRIN AV2 Jig Borer with Co-ordinate Optics.
VICTORIA U2 Rapidmil.
VICTORIA Juniormil.
INVICTA 24in. Major Shaper.
ALBA 48 Shaper.
TOWN Radial, 1¼in. capacity.
PILOT No. 7, 12-ton Press.
BINNS & BERRY Lathe, 12¼in. × 7ft. 6in. b.c.
CARDIFF Lathe, 11in. × 6ft. 8in. b.c.

Early Deliveries—LATHES

COLCHESTER 6in., 7½in., 8½in.
WOODHOUSE & MITCHELL 7in. × 3ft. b.c.
WOODHOUSE & MITCHELL 8½in.
WILLSON 7½in. × 3ft. b.c.

R. KELLY & SONS LTD.,
LIVERPOOL—ROY. 4463.

ALBERT EDWARDS
(MACHINERY) LTD.,
79/89 PENTONVILLE ROAD, LONDON, N.1.
Telephone: TERMINUS 0167/8/9.

New **HERCULES** 30 ton Power Press. Adj., stroke.
TAYLOR & CHALLEN 562, 100 ton Power Press. Adj., stroke. 24in. between. M/D 400/3/50.
BROADBENT 14in. A.G.H. Gap Bed Centre Lathe, 17ft. Bc., 48in. in gap. M/D 400/3/50.
SONDERMAN Vertical Boring Mill. Dia., admitted 43½in. M/D 400/3/50.
LIBBY 1H5 Turret Lathe. 6¼in. hollow spindle.

Classified Advertisements (*PLANT FOR SALE, contd.*)

MARTIN

EMPRESS WORKS, EMPRESS STREET CORNBROOK, MANCHESTER, 16
Tel. Trafford Park 1091-2

USED MACHINES IN STOCK

WARNER & SWASEY 1a Turret Lathe.
POLLARD 3 Spindle No. 3 MT Drill.
CHURCHILL No. 06in. × 18in. Universal Grinder.
HUNT No. 3 Twist Drill Grinder.
WARD HAGGIS SMITH 24in. Surfacing and Boring Lathe.
ARCHDALE 28in. Manufacturing Miller.
REX 6in. Hacksaw.

GUARANTEED REBUILDS
We will rebuild your own machine tools back to makers' specification with 6 months' guarantee.

NEW MACHINE TOOLS IN STOCK OR ON SHORT DELIVERY

H.M.V. Horizontal Borer Type A.V.75, 3in. Travel Spindle.
GRIMSTON 6in. and 7in. Double Ended Grinder.
J. MITCHELL 8¼in. × 4ft. 6in. "M.A.G." Lathe.
WORCESTER 6 ton Crank Press.
QUALTERS & SMITH 10b Band Saw.
RICHMOND S.R.2 4ft. Radial Drill.

TOOLS FOR SALE EX-SITE

BUFFALO 28U Double Ended Punch' Shear and Angle Cropper.
ASQUITH 6ft. Radial Drill with screw cutting attachment.
SCRIVENER 3in. Centreless Grinder.

MACHINES MOTORISED 400/3/50, UNLESS OTHERWISE STATED.

The above list is only a selection. Please call or write for our priced brochure.

Bryant No. 24-36 Hydraulic Internal Grinder, complete with Hydraulic Wheel Dressing device, Spindle, etc.
Further details from:—
C. & G. OLDFIELD, LTD.,
15, Abercorn Street,
PAISLEY.

LEONARD ROTH

ABBOT ST., KINGSLAND HIGH ST., DALSTON JUNCTION, LONDON, E.8.
TERMS ARRANGED
Tel.: CLIssold 0513/4

CARDIFF 7in. S.S.S.C. Centre Lathe, 3 and 4 Jaw Chucks, Suds Pump, etc. 400/3/50. £375.
SMART & BROWN 4in. Precision Lathe with 4 Jaw Chuck, Collets, etc., on Cabinet Stand, 400/3/50. £75.
AMERICAN Tool Works Lathe 9in. × 4ft. 6in. with 4 Jaw Chuck, Motorised 400/3/50. £150.
REDMAN CHURCHILL 7in. Production Lathe, 2¼in. Hollow Mandrel, 32in. between Centres, Motorised 400/3/50. £235.
SOUTHBEND 4¼in. Centre Lathe on Stand, Motorised 400/3/50. 3 Jaw Chuck, etc. £50. Bench ditto £45.
5½in. × 6ft. Centre Lathe, Belt Drive, 3 Jaw Chuck, Taper Turning and Change-wheels. £45.
PLEASE WRITE FOR LISTS

EDWIN MILLEN & SONS LTD.

70, CLERKENWELL ROAD, LONDON, E.C.1.
Tel. CLE. 6064 & 3602.

DRILLING AND TAPPING

HERBERT 3 Spindle Drill. P.F.
ASQUITH 4ft. Radial Drill. S.P.D.
HERBERT 1¼in. Pedestal Drill.
CORONA 4ft. Radial Drill. £325.

GRINDERS

HERBERT HUNT Tap and Reamer. £65.
SCRIVENER No. 1 Centreless, with auto feed.
SMART & BROWN Internal Grinder. 1½in. Max.
NORTON 18in. × 7in. Hyd. Cyl. Grinder. £395.

LATHES

WILSON 7½in. × 36in. Good equip.
HARRISON 7½in. × 36in. Good equip.
COLCHESTER 7½in. × 48in.
SMART & BROWN 4in. × 18in. S.C. Lathe.
HERBERT 2S Capstan.
DEAN, SMITH & GRACE 8½in. × 30in.
SOUTHBEND 6½in. Lathe T/T.
JOHNSTEAD 5ft. 6in. Facing Lathe.
DARLING & SELLERS 10½in. × 12ft. T/T.
HASSE & WREDE 10in. × 42in.
OLDFIELD & SCHOFIELD 15in. × 60in. £650.
HERBERT SMALLPEICE, 6in. × 24in. Multi-tool.
RIVET Instrument Lathe, 4½in. × 24in.

MILLERS (Vert. and Horiz.)

MANN Universal, with Vert. Head.
SENIOR M1 25ft. × 6½in., with Vert Head.
RICHMOND 0.1 Horizongal 30in. × 8in.
CENTEC No. 3R Auto-cycle, pro mill.
HSY Duplex Spline Mill £175.
ADCOCK & SHIPLEY IVM Vert. 25in. × 7in. As new.

POWER PRESSES AND SHEET METAL MACHINES

BLISS 250 ton Coining Press.
BLISS 21B 60 ton geared. Adj. Str.
BLISS 20B 20 ton Roll feed. Adj. Str.
RHODES 30 ton geard, adj. str.
BESCO 20 ton.
WARD 20 ton.
TAYLOR & CHALLEN 10 ton.
SEDGWICK 12ft. × ⅛in. Folder.
BESCO 10 ton Power Press. £175.
E.M.G. 9-ton Airdraulic. £200.

MISCELLANEOUS

TANCO 12in. Bandsaw.
THEIL Filer and Bandsaw.
ALBA 4S 18in. Shaper.
ROWLAND 8in. Abrasive Cutting off.
THERMIC Muffle Furnace.
B. ELLIOT 6in. × 6in. Hydraulic Powersaw.
RAPIDOR 8in. × 8in. heavy duty power saw.
MANURHIN TR12-16 ¼in. Auto. 1958.
MIDSAW 36in. Bandsaw.
BARBER & COLMAN 15in. Hobber.
THIEL Filing and Sawing Machine. £95.
HURTH Key Seating Machine. £225.
THIEL Punch Shaper.
ORMEROD 12in. Shaper with Cam Cutting Attach.
Other machines in stock.

WE BUY | **WE SELL**
EXCHANGES WELCOME | **HIRE PURCHASE ARRANGED**

TRY LIBERTY 6644 FOR YOUR MACHINES

Our stock includes Myford MG12 Grinders, Eagle Surface Grinders, Myford Lathes, Boxford AUD 4¼in. Lathes, Willson 6½in. Lathes, Pacera Drilling Machines from ¼in. to 1¼in. capacity, Startrite Bandsaws, Kennedy, Rapidor and Q. & S. Hacksaw Machines, Centec Milling Machines, 18in. Alba Shapers, Vices and Rotary Tables of all types.

LIBERTY ENGINEERING SUPPLIES LTD.
Colliers Wood High Street, S.W.19

ELLIOTT INVITES YOU

to see the range of
FINE MACHINE TOOLS *at*
B. ELLIOTT (MACHINERY) **LTD**
VICTORIA WORKS, LONDON, N.W.10
Tel. ELGAR 4010

POWER PRESSES IN STOCK

NEW PRESSES

BENTLEY 80 ton Adjustable Stroke, Geared.
HERCULES 40 ton Adjustable Stroke, Geared.
MARTYN 18 ton Blanking Press.
WORCESTER 6 ton Power Presses.

USED PRESSES

JOHN SHAW 700 ton Hydraulic Press, 4 column type. Admits 6ft. × 4ft. on bed area. Daylight 4ft.
RHODES 100 ton Double Crank Press. T/S 5ft. × 3ft. 6in. × 4in. stroke.
CRAIG & DONALD 100 ton Double Sided Geared Press. 6in. fixed stroke.
DANIEL SMITH 75 ton Geared Open Fronted Blanking Press. 1¼in. stroke.
RHODES 30 ton Horn Press. Adjustable stroke 3in.
E.M.B. Flexi-Press. 30 tons. 17½in. stroke.
BRADLEY & CRAVEN 25 ton Open Fronted Press, 2½in. fixed stroke.
BLISS 12 Station Dial Feed Press, 2in. adjustable stroke.
SWEENEY & BLOCKSIDGE No. 9 Open Fronted Press. 1½in. fixed stroke.
H.M.F. 20 ton Open Fronted Press. 2in. fixed stroke.
HEALEY 20 ton Open Fronted Press. Adjustable stroke ¼in.-3½in.
WARD 20 ton Open Fronted Press. 2in. fixed stroke.
SWEENEY & BLOCKSIDGE 10 ton Open Fronted Press. Adjustable stroke ¼in.-2½in.
TURNER 6 ton Open Fronted Press. 2in. fixed stroke.
DANIELS Peletting Press.

ALSO LARGE STOCKS OF NEW AND USED MACHINERY AT—

MARTIN POOLE LTD.,
16/20 WENMAN STREET, BALSALL HEATH, BIRMINGHAM 12
Tel.: Calthorpe 3545

Workpans, Worktrays. Our Special Heavy Gauge, Size 16in. × 14in. × 15½in. Pan, forged handles, marvellous value, 8s. 9d. each. Order from BURTON'S WORKS, Astley, Shrewsbury. Telephone: Shawbury 266.

8in. Centre "Reed-Prentice" m/d all-geared S.S. & S.C. Lathe. Admits 4ft. 6in. b.c., 16 speeds 18-536 r.p.m. Spindle bored 1⅝in. dia. mounted in "Timken" roller bearings. Norton type gearbox.—LEE & HUNT, LTD., Crocus Street, Nottingham. 'Phone: 84246.

New Punching, Shearing, Section Cropping and Notching Machine, universal double ended type, for sale. Cuts flat bars up to 2in. × ½in.; plates any length or width ½in.; rounds 1¼in.; squares 1¼in.; angles at 90 deg. 2½in. × 2½in. × ⅝in. Tees in proportion and also at 45 deg. Punches up to ⅝in. through ⅞in. Depth of punching gap 7½in. Cast steel frame. Mounted on 4-wheel truck. Arranged motor drive 400/3/50.—F. J. EDWARDS LIMITED, 359, Euston Road, London, N.W.1, or 41, Water Street, Birmingham 3.

Classified Advertisements (*PLANT FOR SALE, contd.*)

Cashmores

Selections of Machine Tools from Stock or Early Delivery

DRILLING MACHINES

New **KITCHEN WALKER** 6ft. E. 3 Radial Drilling Machine, No. 5 M.T. spindle.
ASQUITH LDR 4ft. 6in. Radial Drilling Machine, No. 4 MT spindle.
KITCHEN & WADE 6ft. Girder Type Radial Drilling Machine, 18 spindle speeds, 6 feeds, No. 5 M.T. spindle.

BORING MACHINES

WEBSTER & BENNETT Series D 36in. Single Column Type Vertical Boring Mill.

SLOTTING MACHINES

ORMEROD 12in. stroke Slotting Machine, 27in. dia. rotary table.

LATHES

COLCHESTER 8½in. Mascot S.S. & S.C. Gap Bed Lathes, to admit 6ft. 6in. between centres.
CRAVEN 15in. S.S. & S.C. Lathe, to admit 10ft. between centres.
DEAN, SMITH & GRACE Surfacing and Boring Lathe, with hexagon turret, swing over bed 24in., swing in gap 36in.
LANG 12½in. Gap Bed S.S. & S.C. Lathe, to admit 10ft. 6in. between centres.
CRAVEN 15in. S.S. & S.C. Lathe, to admit 25ft. between centres. Two Saddles.

MILLING MACHINES

MILWAUKEE Model 2K Heavy Duty Dial Type Vertical Milling Machine, working surface of table 56in. × 12in.
ST. ANDRE Horizontal type Heavy Duty Plain Milling Machine, table size 73in. × 16½in.
VICTORIA V.3 Vertical Milling Machine, swivel head, power feeds and rapid traverses to table in all directions, working surface of table 60in. × 12½in.
C.V.A. "Kearney & Trecker" model 2E Dia. Type Horizontal Plain Drilling Machine, working surface of table 41in. × 12in., longitudinal feed 29in., cross feed 12in., 8 spindle speeds 25/1,000 r.p.m.
CINCINNATI Model 3/36 Hydromatic Milling Machine, table 54in. × 14in.

BROACHING MACHINE

CINCINNATI 10 ton Vert. Single Ram Hydraulic Surface Broaching Machine, 66in. stroke. 20in. × 20in. table.

GRINDING MACHINES

JONES & SHIPMAN Fig. 540 18in. × 6in. Hydraulic Horizontal Spindle Surface Grinding Machine, with 14in. × 6in. magnetic chuck.
JONES & SHIPMAN 8in. × 16in. Tool and Cutter Grinding Machine.
CHURCHILL 16in. × 36in. Model PBH Universal Grinding Machine, with hydraulic feed and internal grinding attachment.

PLANING MACHINE

STIRK 10ft. × 4ft. 6in. × 4ft. 6in. "Hilioplow" Double Column Planing Machine, with four toolboxes, Stirk Split Field Motor Drive.

POWER PRESSES

HORDERN MASON & EDWARDS Model L.70 Power Press, 70 tons capacity, adjustable stroke ⅛in. to 4⅛in. table 30in. × 26in.
One New **PEARSON** 75 ton Hydraulic Press Brake, 9ft. × 4in. capacity.
New **BUTTEALEY** No. 4, 20 Ton Ungeared Power Press, 11in.-3in. adjustable stroke.

SAWING MACHINES

NOBLE & LUND 40/48in. Cold Circular Sawing Machine, 17in. diameter rounds, 15½in. squares, 27in. × 12in. S-Beams.
NOBLE & LUND 24in./28in. Cold Circular Sawing Machine, 10in. dia. rounds, 9in. squares, 18in. × 7in. seams.

SCREWING MACHINES

KENDALL & GENT 3-2 Tangential Head Screwing Machine, to screw bolts up to 2in. outside diameter, tubes up to 3in. inside diameter, machine fitted with lead screw.

MISCELLANEOUS

CLYDE 10 ton Overhead Electric Travelling Crane, 52ft. 3in. span.

All the above machines are motorised 400-440/3/50 cycles.

JOHN CASHMORE LTD.,
GREAT BRIDGE, STAFFS. Tel.: Tipton 2181/7.
(Also at **NEWPORT, MON.**)

HELIOT

35 GREENWICH CHURCH ST. LONDON. S.E.10 GRE.1222

All machines motorised 400/3/50 unless otherwise stated

CAPSTAN LATHES

WARD 7, 2in. capacity (not covered bed, apron missing).
WARD 7, 2¼in. capacity, covered bed, collet head and bar feed.
WARD 7, 2in. capacity, covered bed, chucking.
WARD 3A, 2in. capacity, air collet and bar feed, power saddle.
WARD 2C, 1¼in. capacity, air collet, bar feed, power saddle.
WARD 2A, 1¼in. capacity, collet head.

TURRET LATHES

WARD No. 16, covered bed, 8¼in. spindle, 32in. 4-jaw chuck, rapid and power feeds to saddle, cross slide and turret, power rotating turret, spindle speeds 7-225 r.p.m., 50 h.p. motor.
WARD No. 10B, covered bed, 4¼in. spindle, power rotating turret, power and rapid feeds to turret only, collet head and bar feed.
WARD No. 7, 2¼in. capacity, covered bed, chucking.
WARD No. 7, 2¼in. capacity, covered bed, collet head, bar feed, screwcutting, surfacing and sliding, 2 speed motor.

TAPPING MACHINES

HERBERT No. 2 Flashtap, ¼in. capacity.

HORIZONTAL MILLERS

SUNSTRAND No. 2 Electromil, automatic cycle, 54in. by 12in. table.
EDGWICK No. 2, prismatic overarm, 42in. by 11in. table.
JONES & SHIPMAN duplex slot miller, hydraulic feeds.
HERBERT 3ND, prismatic overarm, 58in. by 15in. table, 36in. auto feed.
CENTEC model 3R, electronic control high speed production mill, 34in. by 11in. table, 14in. stroke, spindle speeds to 3,000 r.p.m.

VERTICAL MILLERS

WADKIN high speed for light alloy, 40in by 16in. table.
HERBERT 1SS, 48in. by 11in. table, sliding head.

GRINDING MACHINES

BROWN & SHARPE No. 2 surface grinder, 18in. by 6in. capacity.

MISCELLANEOUS

HERBERT power hack saw blade sharpening machine.
SWEENEY & BLOCKSIDGE fly press.
E.M.B. air press.
AVERY computor scales 1-10 and 1-100.
SUNNEN honing machine.

Thiel No. 3 Filing and Sawing Machine. Incorporating bandsaw and brazing attachment. Motorised.—WILCOX & CO., Barr Street, Birmingham 19. NORthern 1234/5.

F. J. Edwards Ltd

GRINDING MACHINES

BILLETER Twin-Head Radial Arm, Open Sided Hydraulic Slideway Grinder, table 9ft. 8in. × 2ft. 3in.
NORTON 10in. × 36in. Hydraulic Plain Grinder
JACKMAN No. 28 53in. Horiz. Disc Grinder.
JACKMAN 24in. Vertical Double Disc Grinder.
CHURCHILL 12in. Rotary Piston Ring and Surface Grinder.
ARTER 16in. Rotary Piston Ring and Surface Grinder.
KITCHEN & WADE V9 Honing Machine; capacity ¼in. to 2in. dia. × 5in. long.
DELAPENA Model 301 cabinet stand Honing Machines, capacity .120in. to 3.125in., with assortment of wedges, adaptors, mandrels and stones.
LUMSDEN 14in. × 3in. 4-wheel Grinder.
B.S.A. 12-5 Centreless Grinder, 5¼in. capacity.
HUNT ¼in. and 2in. Twist Drill Grinders.

CAPSTAN AND TURRET LATHES

HERBERT No. 4 Senior Capstan Lathe, 15½in. swing over bed, 40-1,000 r.p.m.
HERBERT No. 4 Capstan Lathe; 511 r.p.m., with bar feed and chasing saddle.
HERBERT 2B Capstan Lathe; 1¼in. capacity.
GISHOLT No. 4 Capstan Lathe, 18¼in. swing, 2in. bar capacity.
BARDONS & OLIVER No. 5 Universal Turret Lathe, swing 18in. over bed, 2¼in. hollow spindle.
GISHOLT 21. Turret Lathe, swing 22¾in. over bed, 4⅛in. hollow spindle, chasing saddle, cross sliding turret.
WARD No. 7 Combination Turret Lathe, swing 14¾in. dia., 2in. ball chuck, chasing saddle.
HERBERT No. 7 Combination Turret Lathe, 16¼in. swing over bed; 2⅜in. hollow spindle; well equipped.
WARNER & SWASEY No. 3A Turret Lathe, 23¼in. swing; 4¾in. hollow spindle, taper turning attachment.
HERBERT No. 21 Combination Turret Lathe, swing 33¼in. over bed, 7¼in. hollow spindle.
HERBERT No. 12 Combination Turret Lathe, swing 23¼in. dia. over bed, 6¼in. hollow spindle, chasing saddle, roller bearing spindle, covered vee bed; full equipment.
WARD No. 3A Motor Driven Capstan Lathes with ball chuck and bar feed equipment.

GENERAL LATHES

NEW 12in. Centre Gap Bed Lathes; 80in. between centres; 15 to 550 r.p.m. and 5in. centre.
OLDFIELD & SCHOFIELD 21in. centre Gap Bed Lathe, 7ft. between centres, 4¼in. hollow spindle, 62in. swing in gap.
STANLEY 7in. Gap Bed Lathe.
SOUTHBEND 7¼in. and 15in. centre Lathes.
SMART & BROWN 4¼in. Sabel Lathes.
LE BLOND REGAL 5in. Lathes.
LANG Junior 6¼in. Lathe.
SEBASTIAN 8in. Lathes.
BETTS-BRIDGFORD 15in. centre × 22ft. bed Lathes, 16ft. between centres.
WILLSON 7¼in. × 6ft. Gap Bed Lathe, admit 3ft. between centres, hollow spindle 2¼in. dia.
DEAN, SMITH & GRACE Model 13Z Minor, 6¼in. × 6ft. Lathe, 2ft. 7in. between centres, speeds 28 to 889.
LE BLOND 20in. Rapid Production Lathe, admit 7ft. between centres.
LANG 26in. swing Surfacing and Boring and Screwcutting Lathe, hexagon turret, 3¼in. hollow spindle.
CHURCHILL-REDMAN 11in. Centre Lathe, 36in. swing in gap, 5ft. between centres, 3¼in. hollow spindle.

MILLING MACHINES

PEDERSEN Horizontal Miller, table 49in. × 10in., capacity 24in. × 7¼in. × 16in.
MILWAUKEE 4K Horizontal Milling Machine, table 82in. × 18in., capacity 42in. × 14in. × 20in., power rapid traverses, speeds 13 to 1,300 r.p.m.
EDGWICK No. 2 dial type Horizontal Miller, table 46in. × 11in., capacity 25in. × 7in. × 17in.

359-361, EUSTON RD., LONDON, N.W.1
Telephone: EUSTON 5000 Telex No. 24264
And at Lansdowne House, 41, Water St., Birmingham, 3. *Telephone: Central 7606-8*

The HYPROFILLE

ELECTRO HYDRAULIC COPYING SYSTEM

For one, two or three-dimensional control attach the power units to the machine feed shafts for copy milling, turning or planing, 360° profiling and three-dimensional machining from models or templates

This illustration is the subject matter of British and Foreign Patents.

A Control Cabinet for interlocked tracer control for one, two or three-dimensional machining with combined 360° profiling with depth control.

B High Torque Power Units for attaching to the machine feed shafts.

C Electric Tracing Head for universal copying from models or templates.

Full particulars sent on application

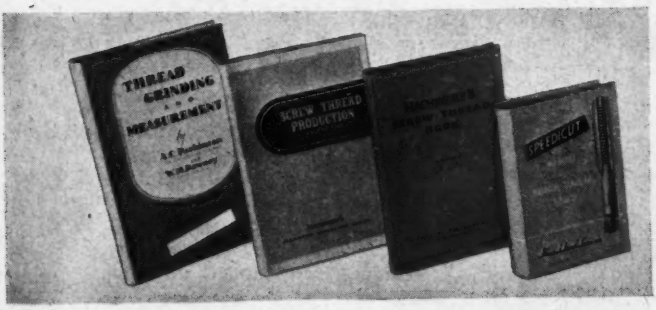
ARMYTAGE (TOOLS) LTD.

FOUNDRY LANE, KNOTTINGLEY, YORKSHIRE

Telephone: Knottingley 2743/4 Telegrams: Armytage Bros., Knottingley

MACHINERY'S BOOKS ON . . .

SCREW THREADS Etc.



MACHINERY'S HANDBOOK
—E. Oberg and F. D. Jones
The 16th Edition of this world-famous book has been revised and enlarged to 2,104 pages. Completely up-to-date, it is the finest reference work obtainable for *ALL* those engaged in the metal-working industries. Covers the entire field of workshop practice. Whether your interest is engineering, design, or production, you should have the latest facts, formulae and dimensional data at hand for ready reference. A reliable working Handbook that will answer your questions; provide ready solutions to your problems, and give you the information you need—when you need it. Bound and produced to give years of everyday use.
Price **96s.** cash and C.O.D. Instalments **106s.**, payable **16s.** in 10 days, **18s.** monthly. Overseas, cash with order, plus 4s. postage.

THE USE OF HANDBOOK TABLES AND FORMULAS
Contains some 500 worked-out problems in mechanical engineering and workshop practice, showing how the data given in Machinery's Handbook may be applied. Prospective purchasers should note, however, that this book cannot be fully effectively used except in conjunction with a copy of a recent edition of the Handbook.
Price **16s.** cash and C.O.D. Instalments **17s. 6d.**, payable **5s. 6d.** in 10 days, **6s.** monthly. Overseas, cash with order, plus 2s. postage.

CHAMBERS' 7-FIGURE MATHEMATICAL TABLES—James Pryde
Contains common logarithms of the natural numbers; logarithms of sines, cosines, tangents, contangents, secants and cosecants; *also* the natural values of the same trigonometrical functions. Other tables and constants to facilitate calculations are included.
Price **8s. 6d.** cash and C.O.D. Instalments **9s. 6d.**, payable **5s.** in 10 days, **4s. 6d.** one month later. Overseas, cash with order, plus 2s. 6d. postage.

SCREW THREAD PRODUCTION (S.R.) (2 Vols.)—
—J. S. Murphy
These volumes are planned to cover all known methods of producing screw threads.
Vol. 1 deals with screw cutting, self-opening die heads, tapping and screw thread inspection.
Vol. 2 contains the subjects of thread chasing as employed in special machines, thread rolling, thread milling and thread grinding.
Price **20s.** per volume cash and C.O.D. Instalments **22s.**, payable **8s.** in 10 days, **7s.** monthly. Overseas, cash with order, plus 2s. 6d. per volume postage.

MACHINERY'S SCREW THREAD BOOK
This well-known reference book on screw thread systems, includes British, American, German, French and Swiss standard practice. Amongst the threads covered are Acme, Buttress, B.A., B.S.F., B.S.W., B.S.P., Conduit, Cordeaux, Edison, Bottle closures, Petroleum Institute, Well Casing, Horological and Optical, as well as the Unified system, and the American National. Precision gauging by wires is comprehensively covered with newly calculated tables of constants. Accepted tolerance systems are given. Cloth board cover.
Price **10s.** cash and C.O.D. Instalments **11s.**, payable **5s. 6d.** in 10 days, **5s. 6d.** one month later. Overseas, cash with order, plus 2s. 6d. postage.

THREAD GRINDING AND MEASUREMENT
—A. C. Parkinson and W. H. Dawnay
Covers thread grinding, profile crushing, plunge grinding, single, dual and multi-rib wheels, grinding wheels, diamond tools—coolants—internal threads—production times. Measurement methods include ring screw gauges — calipers — micrometers — Vee pieces — measuring machines—contour projectors—3-wire—parallels. 227 Pages. Well illustrated.
Price **21s.** cash and C.O.D. Instalments **23s.**, payable **8s.** in 10 days, **7s. 6d.** monthly. Overseas, cash with order, plus 2s. 6d. postage.

FREE APPROVAL **NO DEPOSIT** **INSTALMENTS**

To MACHINERY National House, 21, West Street, Brighton, 1, Sussex.
Please send me the Books marked X. For CASH herewith or by C.O.D. or ON APPROVAL when I will return in 5 days or pay FULL CASH, or by INSTALMENTS, as stated above.

NAME ..... *SIGNATURE* .....

ADDRESS ..... *FIRM* .....

..... *POSITION* .....

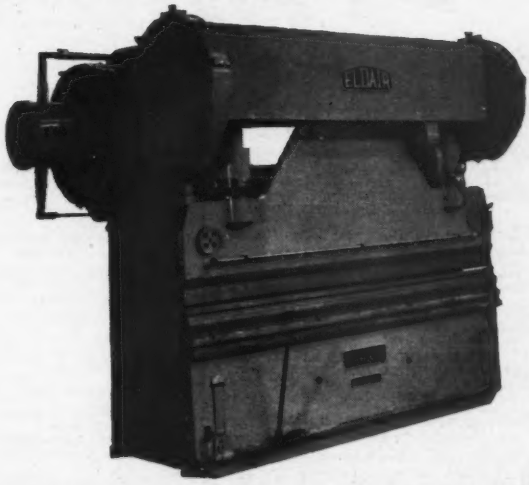
Write for Book Catalogue and details of Instalment Terms. *Free Examination Scheme applied to the U.K. and Eire only*

Classified Advertisements (*PLANT FOR SALE, contd.*)

ELDAIR *Mechanical* PRESS BRAKE

Capacity 8′ × ¼″ (EX-STOCK DELIVERY)

A thoroughly reliable overcrank machine, applying 110 tons pressure over a die length of 10ft. by ⅜in. All parts are engineered to the highest standards, allowing constant ease of operation with minimum maintenance. A special feature is the simplicity with which accurate top beam settings can be achieved. Massively constructed for long life; weight about 11 tons. Many optional extras and variations available.



Please write for further details to:

KINGSLAND

ENGINEERING COMPANY LIMITED.

25-37 HACKNEY ROAD, LONDON, E.2. Tel: SHOreditch 6357

For all metal working machines

New 6ft. 0in. × 3ft. 6in.; 7ft. 0in. × 4ft. 0in., and 10ft. 0in. × 3ft. 0in. Marking Off Tables for sale. Accurately machined top face and heavily ribbed. Mounted on cast iron legs. Total height approx. 34in.—Illustrations and full details from F. J. EDWARDS LIMITED, 359, Euston Road, London, N.W.1, or 41, Water Street, Birmingham, 3.

HIGH QUALITY USED MACHINE TOOLS

COVMAC 17in. Swing A.G.H. Gap Bed S.S. & S.C. Lathe. 5ft. 0in. B.C. 400/3/50.

Used **SPRINGFIELD** 10in. Centres Gap Bed Screwcutting Sliding, Surfacing Lathe. 36in. B.C. 400/3/50.

Used **COLCHESTER** 8½in. Centre S.S. & S.C. Gap Bed Lathe. 58in. B.C. 400/3/50.

Used **MITCHELL OF KEIGHLEY** 8½in. Centre A.G.H. Gap Bed S.S. & S.C. Lathe. 4ft. 4in. B.C. 400/3/50.

ARCHDALE 20in. Milling Machine, table size 40in. × 10in., power and rapid traverses to table, reversing spindle, backlash eliminator. 400/3/50.

BARDONS & OLIVER No. 3 Universal Turret Lathe. 400/3/50.

WARNER & SWASEY 1A Turret Lathe. 400/3/50.

RUSSELL Saw Sharpening Machine, max. capacity 42in. diameter. 400/3/50.

ORMEROD 12in. Slotting Machine. 400/3/50.

WE UNDERTAKE REBUILDING OF ALL TYPES OF MACHINE TOOLS

CENTAUR TOOL WORKS,

EYRE STREET, SPRING HILL, BIRMINGHAM, 18

Tel. EDGbaston 1118 & 1119. 'Grams Capstan, Birmingham

SELECTED MACHINES

BECHLER CER 50 Single Spindle Automatic, Ser. 600516. 2in. bar cap, speeds up to 1,500 r.p.m. Complete range of tooling, collets and feed fingers. Vast quantity of new spares.

C.V.A. No. 8 S.S. Automatic Ser. 31488. ⅛in. cap., range of tooling, collets, etc., bar feed.

WANDERER Vertical Mill, Type 1FV. Ser. 5463. 1954. Swivel head, No. 50 I.T. 16 speeds—45 to 1,400 r.p.m. Table 39in. × 12in., Power feeds and rapid traverse all directions. Coolant. Late type machine.

PEGARD Auto Production Mill, speeds 22 to 1,128 r.p.m. Table w/8 30in. × 12¼in. Auto feed cycle. Kneeless with R and F head, retractable spindle, coolant. Late type machine.

RHODES No. 2 Double Side Inclinable Dieing Press. 45 tons, variable strokes per min. 10 to 450. Adjustable stroke ⅛in. to 2¼in., roll feed and scrap shear.

All machines motorised 415/3/50.

A. LAWRENCE & CO., (MACHINE TOOLS) LTD.,

WELSH HARP, EDGWARE ROAD, LONDON, N.W.2.

Tel. GLA. 0033.

Haemmerle Combined Flanging Press. Cutting capacity 8in. Nominal length 8ft. Max. pressure 175 tons. Purchased 1959. Excellent condition.—Details from: MACHINE TOOL CONSULTANTS, 147, Bath Street, Glasgow.

NEW MACHINES FOR IMMEDIATE DELIVERY

AMC K1500 Crank Shaft Regrinder, swing-over table 19½in., max. crank throw 4in.

POLAK Die Casting Machines. Model CL085-8 Horizontal Plunger. Die Lock 85 ton. Capacity 2 lbs. aluminium. Model CLP85-15 Vertical Plunger. Die Lock 85 ton. Capacity 2 lbs. aluminium.

SCHMALTZ APR600 Horizontal spindle 24in. dia. Rotary Table Surface Grinder.

TOS Model FEK.80 Production Cam Milling Machine.

MECOF Model CS.6 Milling and Boring Machine with Traversing Column. Table 38in. by 155in., spindle speeds (9) 39-1,132 r.p.m.

ELGAR MACHINE TOOL CO. LTD.

172-178 VICTORIA ROAD, ACTON, LONDON, W.3.

Telephone: ACOrn 5555 (7 lines)

Classified Advertisements (PLANT FOR SALE, contd.)

Newman

AUTOMATICS

BULLARD Multi-Au-Matic 7in. 8 spindle.
BULLARD Multi-Au-Matic 12in. 6 spindle.

BORING MACHINES

WETZEL Horizontal traversing column Floor Boring and Facing Machine, 7in. diameter travelling spindle, 45in. diameter facing head. (Two available.)
KEARNS Model OB Horizontal Boring and Facing Machine, 2½in. diameter travelling spindle (1957).
UNION Model BFT100 Horizontal Boring and Facing Machine, 4in. diameter travelling spindle (1955).
KEARNS Model OC Horizontal Boring Machine, 3in. dia. travelling spindle.
KEARNS No. 4 Horizontal Boring and Facing Machine, 4in. diameter travelling spindle.
WEBSTER & BENNETT Vertical Boring Machine, table 50in. diameter.
RICHARDS Type PRT Horizontal Floor Boring Machine, 3½in. travelling spindle, 28in. diameter facing head.

CAPSTAN AND CENTRE LATHES

CHURCHILL-REDMAN Model 13NM Heavy-Duty S.S. & S.C. Gap Bed Centre Lathe, 13in. centre height × 72in. between centres. Swing in gap 50in.
MITCHELL Model DM10 S.S. & S.C. Gap Bed Centre Lathe, 10½in. centre height × 7ft. 5in. between centres. (NEW.)
OLDFIELD & SCHOFIELD Surfacing and Boring Lathe, 10½in. centre height.
WARD 7B Combination Turret Lathe.
NILES Heavy Duty Centre Lathe, S.S. & S.C. 17in. centre height × 28ft. between centres.
U.L.R.O. Heavy Duty Centre Lathe, 16in. centre height × 30ft. between centres.

DRILLING MACHINES

HETTNER Radial Drilling Machine, 10ft. elevating arm.

GEAR MACHINES

ORCUTT Model HM24 Hydraulic Internal Gear Grinder.
GLEASON 3in. Straight Bevel Gear Generator.

GRINDING MACHINES

CRAVEN Roll Grinding Machine, capacity 20in. swing × 138in. between centres.
CHURCHILL Model HBY Internal Grinding Machine.
CHURCHILL Plain Cylindrical Grinding Machine, 26in. swing × 84in. between centres (1951).
LANDIS Type C Plain Hydraulic Cylindrical Grinding Machine, 6in. swing × 18in. between centres.
ORCUTT Model HM24 Internal Spur Gear Grinding Machines.
CHURCHILL Plain Hydraulic Cylindrical Grinding Machine, 20in. swing. × 72in. between centres.
BROWN & SHARPE Plain Cylindrical Grinding Machine, 10in. swing × 36in. between centres.

MILLING MACHINES

CINCINNATI Model 5/72 Plain Hydromatic Milling Machine, table 91in. × 22in. (1962).
CINCINNATI No. 2L Plain Horizontal Milling Machine, table 52in. × 10in.
CINCINNATI No. 1M Vertical Milling Machine.
CINCINNATI No. 4 Dial Type Horizontal Milling Machine.
PRATT & WHITNEY Model BL3620 3-spindle "Keller" Die Sinking Machine.
CENTEC Model 3E Automatic Production Milling Machine, table 25in. × 16in.

MISCELLANEOUS

LANGE & GAILEN 28in. stroke Double Headed Hydraulic Shaping Machine.
TAYLOR & CHALLEN Double Sided 50-ton Geared Power Press, 10in. stroke.

NEWMAN INDUSTRIES LIMITED

Machine Tool Division: YATE, BRISTOL

Tel.: Chipping Sodbury 3311. Telex. 44121. Cables: "Dynamo Yate."

London Office: Terminal House, Grosvenor Gardens, S.W.1. Tel.: Sloane 8206. Telex. 23280.

K·E·N·T

PRESSES

Hammerle 60 ton Hydraulic Press, 14in. max. stroke, 28in. × 36in., table as new.
C.V.A. 10 ton Dieing Press.
Rhodes Incl., 25 ton.
Weingarten Incl., 30 ton.
Edwards Incl., 18 ton, Var.
Hi-ton 3 ton Hydraulic.
Edwards 4 ton, Var.

LATHES

8½in. Holbrook Model B Collets.
8½in. Pratt & Whitney.
14in. × 14ft. Betts Bridgeford.
18in. × 12ft. D.S. & G. S. & S. only.
Student 6in., with equip.
Le Blond 7½in. Gap Bed.

MILLING MACHINES
Vertical

Archdale 18in., 40in. × 10in.
Herbert 15S, 49in. × 11in.
Jason S1 and Sw head.

Horizontal

Archdale 20in.
Reiden H.F. 30, 60in. × 14½in.
Archdale 14in. Hor.

CAPSTAN AND TURRETS

Ward 7 Capstan, covered bed.
Ward 7 Comb. lathe.
Murad 34 ¾in. Capstan Lathe.
Modern 1¼in. Capstan Lathe.

GRINDERS

Brown & Sharpe No. 2 Surface.
Robot No. 2.
J. & S. Univ. and T. & C.
Abwood Vertical Surface.

DRILLING MACHINES

Archdale 4ft. Radial, 2in. cap.
K. & W. 3ft. 6in. Radial, 1¼in. cap.
Corona 2 spindle 3 M.T., power feed.
Archdale Vert. drill with floating table.

MISCELLANEOUS

Holroyd AN6 Thread Mill.
Artos Cutting-off Machine.
Alba 14in. Shaper.
Invicta 1M Shaper.
Hutto Vertical Honer.
Newall Lapper.
Electricar Truck and charging panel.
Tauco Abrasive Cut-off.
"Orr" Abrasive Cut-off Sliding table.

All motorised 400/3/50.

K·E·N·T MACHINERY & ENGINEERING CO.

Datchelor Place Mews, London, S.E.5

Telephone: ROD 4149

18in. 'Rapidor - Manchester' Hacksaw, 3 h.p. Motor, Geared Sud Pump and Vice. Further details from:—
C. & G. OLDFIELD, LTD., 15, Abercorn Street, PAISLEY.
Member of B.A.M.T.M.

36in. "Lang" m/d All-gd. S.S. & S.C. Chucking Lathe with taper turning attachment and 30in. four-jaw chuck. Admits 36in. between chuck and saddle. 20 h.p. 400/3/50 motor. 12 spindle speeds 8.5-403 r.p.m. Spindle bored 2¾in. dia. mounted in "Timken" roller bearings.—LEE & HUNT LTD., Crocus Street, Nottingham. 'Phone: 84246.

Two Ingersoll Rand 40B 2-stage Air Compressors, 150 and 180 c.f.m. at 100 lb. per sq. in. Motor 35 and 45 h.p. 400/3/50. Approx. six years old.—ROLLS TOOLS LTD., Pyrford Road, Pyrford, Woking, Surrey.

WIDDOWSONS

PENSOTTI Model KTV1050 Turret Type Single Column Vertical Boring and Turning Mill. With sidehead. To swing 43in. dia., admit 32in. under cross slides, 20 h.p. motor.

JONES & SHIPMAN Model 921 Heavy Duty Pillar Drilling and Tapping Machine. No. 5 M.T.

DEMM Model S.18-750 Gear Shaping Machine.

REINECKER Model SSM3 10ft. Heavy Duty External and Internal Spur Gear Shaping Machine. 6½in. face width.

ALFRED HERBERT No. 9a Heavy Duty Combination Turret Lathe, 20½in. swing over bed, with taper turning attachment, spindle speeds 11 to 809 r.p.m., covered bed, well equipped.

KAESER (Swiss) Hydraulic Plain Cylindrical Grinding Machine. Two machines available. Capacity 6in. × 36in. and 10in. × 20in. Both in excellent condition.

CHURCHILL Model VB Slideway Grinding Machine, 72in. × 34in. × 36in. Excellent condition.

SCULFORT FOCKEDY 12in. Centres High Speed Gap Bed S.S. & S.C. Lathe, 14ft. between centres.

OLDFIELD & SCHOFIELD 32in. Swing Gap Bed S.S. & S.C. Lathe, 10ft. between centres, swing in gap 50in. × 16in. Taper turning attachment.

MITCHELL 8½in. Centres Gap Bed S.S. & S.C. Lathe. Several available. All As New. 52in., 54in. and 64in. between centres.

WARD No. 13 Combination Turret Lathe, covered bed, 25in. concentric chuck, 27in. 4-jaw independent chuck. Good turret tooling, taper turning attachment, 35 h.p. motor, 400/3/50. Modern machine. Excellent equipment.

KENDALL & GENT 4ft. × 4ft. × 4ft. Plano Milling Machine. With vertical head, 27 spindle speeds 12 to 700 r.p.m., 9 feeds to table.

CINCINNATI Hydromatic 56-72 Hydraulic Plain Horizontal Production Milling Machine. Table 103in. × 26in., speeds 24 to 179 r.p.m.

CINCINNATI Model 4HP Heavy Duty Vertical Milling Machine. Table 72in. × 19in., speeds 17 to 480 r.p.m.

ORMEROD 20in. Stroke Pedestal Type Shaping Machine. 9 speeds 9 to 104 s.p.m., 5 h.p. motor. Two machines available.

MASSEY 2-cwt. Pneumatic Power Hammers, 14in. stroke, 200 blows per minute, 10 h.p. motor.

HERBERT WIDDOWSON & SONS LTD.

CANAL STREET, NOTTINGHAM

'Phone: 51891

R. O. GRAY

PARKSON 2T Universal Milling Machine. Table size 49in. by 10in. With Universal Dividing Head, arbor, arbor support and self-contained electric suds pump.

BROWN & SHARPE No. 2 Universal Milling Machine. Table 46in. by 10in. With Vertical Milling Attachment, Slotting Attachment, Universal Dividing Head, chuck, rotary table, and other equipment.

ARCHDALE 28in. Plain Horizontal Milling Machine, prismatic over-arm, power feed and rapid traverses. Table 49in. by 13in. With arbor, two arbor supports, arm brace, self-contained electric suds pump.

ARCHDALE 20in. Plain Horizontal Milling Machine. Table 41in. by 10in. Dial type feed and speed change. With arbor and arbor support, arm brace, separate electric suds pump and tank.

EDGWICK 18in. Plain Horizontal Milling Machine. Table W.S. 26in. by 7in.

ASQUITH two Spindle Profile Milling Machine Capacity 24in. by 28in. Spindle speeds 250 to 3,000 r.p.m.

THREE HERBERT O.V. Vertical Milling Machines, swivel head. Table W.S. 18in. by 5in. Spindle speeds 250 to 2,000 r.p.m.

TRIDENT Model V.O. Swivel head Vertical Milling Machine. Table W.S. 30in. by 8in. Spindle speeds 130 to 800 r.p.m.

CHURCHILL Horizontal Spindle Surface Grinder. Table W.S. 13in. by 36in.

DISKUS Vertical Spindle Surface Grinder, hydraulic. Size of table 53in. by 10in. 14in. dia. segmental wheel.

CHURCHILL Model "O" Universal Tool and Cutter Grinder. Capacity 8in. by 16in.

PFAUTER R.S.1 type Vertical Gear Hobbing Machine, single pulley drive.

PFAUTER R.S. 11 Horizontal Gear Hobbing Machine.

DAVID BROWN Worm Shaft Milling Machine, 4in. centres by 33in. between centres. Single pulley drive.

EDGWICK No. 1 Keyseating Machine.

WARD No. 2A Capstan Lathe, with ball chuck and bar feed.

WARD No. 3A Capstan Lathe, with ball chuck and bar feed.

HERBERT No. 7 Junior Combination Turret Lathe, flamard bed, chucking.

DRUMMOND Model K Capstan Lathe. 2$\frac{1}{16}$in. Hollow spindle. Chucking.

HERBERT No. 2B Capstan Lathe, chucking.

HERBERT No. 1S Capstan Lathe, chucking.

TWO MOREY No. 2G Capstan Lathes, chucking. 1in. capacity.

HERBERT 1$\frac{1}{2}$in. Single Spindle Bar Automatic, with equipment.

DEAN, SMITH & GRACE A.N. type 7in. by 4ft. between centres, S.S. & S.C. Gap Bed Lathe. 2in. Hollow spindle. Swing in gap 24$\frac{1}{2}$in. by 7$\frac{1}{2}$in. With chucks, etc.

CARSTENS 4$\frac{1}{2}$in. by 20in. between centres S.S. and S.C. High speed Precision Lathe, fully equipped collets, chucks, etc.

CHURCHILL CUB 5in. by 20in. between centres S.S. & S.C. Lathe, with chucks, pick-off gears.

LODGE & SHIPLEY Heavy Duty Manufacturing Lathe, 9in. Centres by 5ft. between centres. Single Pulley all-geared.

KEARNS No. 2 Horizontal Boring and Facing Machine, with Vernier Height Gauge and boring bars.

KEARNS No. O.A. Production type horizontal Boring Machine with 2in. dia. traversing spindle.

KITCHEN & WADE Heavy Duty Pillar Drill. Spindle bored No. 4 M.T. Rise and Fall table, 24in. dia., swings round column.

ARCHDALE 2 Spindle Relieving Drill. No. 1 M.T. Power feed and independent motor to each spindle. Table W.S. 36in. by 15in.

HERBERT Single Spindle Drilling Machine on 2 spindle base, geared automatic feed, air operated. No. 3 M.T. Table W.S. 14in. by 22in.

HAHN & KOLB 2 Spindle Drilling Machine. Power feed and independent motor drive to each spindle, fitted $\frac{1}{2}$in. drill chuck.

WOTAN 16in. Crank Shaping Machine.

ALBA 18in. Crank Shaping Machine.

THIEL No. 6 Radial Arm Tapping Machine, capacity $\frac{1}{2}$in. Whit.

JONES & SHIPMAN Electrotap, with quantity of leaders.

SIX TURNER Spin Riveting Machines, type R.S.5, air operated.

CANNING Centreless Polishing Machine, with motorised dust extractor.

EDWARDS 4ft. by 14g Power Guillotine.

TAYLOR & CHALLEN 10 Ton Inclinable Power Press, $\frac{1}{2}$in. stroke.

All machines self-contained drive. 400/440 volts, 3 phase, 50 cycles.

R. O. Gray

4/6 MINERVA ROAD, PARK ROYAL, LONDON, N.W.10

Telephone: ELGar 4841/4842

Classified Advertisements (*PLANT FOR SALE, contd.*)

NORTON FOR NEARLY NEW MACHINE TOOLS

ANOTHEBU

MANY OFFERE%

BRITISH AMERICAN AND CONTINENTAL MAKERS INCLUDING :—

ARCHDALE
ASQUITH
B.S.A.
BARNES
BROWN & SHARPE
BUTLER
CHURCHILL
CINCINNATI
CONOMATIC
CRAVEN
DEAN, SMITH & GRACE
DEFIANCE
DENN

NORTON MACHINE TOOLS AUTOMATICS

SINGLE SPINDLE
B.S.A. 38 ¼in. Cap.
HERBERT No. 4 Chucking.
MULTI SPINDLE
CONOMATIC (U.S.A. Built) 4 Sp. 4⅛in. Cap.
GREENLEE 6 Sp. 1⅛in. Cap.
CONOMATIC 6 Sp. 1¼in. Cap.
B.S.A. GRIDLEY 4 Sp. ⅜in. Cap.
GRIDLEY 6 Sp. 7/16in. Cap. (choice of two).

NORTON MACHINE TOOLS LATHES

CAPSTAN, COMB, TURRET LATHES
LIBBY 2H Comb. Hole in spindle 8in.; 5/165 r.p.m.
LIBBY 1HS Comb. Hole in spindle 5⅛in. Power and rapid feeds to saddle, Turret and Cross slide.
GISHOLT 2L Comb. 22in. swing. 1952 built.
HERBERT 21 Comb.
WARD 10B Comb. Power feed to turret, Air Ball Chuck, Bar Feed Equipment Rebuilt.
HASSE & WREDE 3-6701 Comb. Hole in spindle 4 7/16in. (Selection of seven.)
HASSE & WREDE 1-5651 Comb. Hole in spindle 2¼in. (Choice of three.)
WARD 7 Capstan; 37 to 750 r.p.m.
MOREY No. 4 Bar Capstan 2in. Cap. (Choice of two.)
GISHOLT No. 4, Chucking Capstan. Power feeds, 39 to 500 r.p.m.
CENTRE LATHES
SWIFT 13in. by 132in.; 3·6 to 220 r.p.m. Straight Bed.
SPRINGFIELD 12in. by 48in.; 9 to 380 r.p.m. Straight Bed.
SCULFORT 12in. by 70in.; 12·5 to 1,000 r.p.m.
DEAN, SMITH & GRACE 12in. by 66in.; 19 to 418 r.p.m. Straight Bed.
PROGRESSIVE 11in. by 11in.; 20 to 516 r.p.m. Gap Bed.
SWIFT 10½in. by 96in.; 11 to 400 r.p.m. Straight Bed.
MONARCH 20in. swing 96in. B.C. 12 to 180 r.p.m. Straight Bed.
HENDY 10in. by 48in. 14 to 560 r.p.m. Gap Bed.
DEAN, SMITH & GRACE 8½in. by 50in.; 11 to 490 r.p.m. Straight Bed.
DEMOOR 8¼in. by 42in.; 31·5 to 250 r.p.m. Gap Bed.
HOLBROOK 8¼in. by 42in.; choice of two. Straight Bed.
HASSE & WREDE Type 1-7601 8¼in. by 40in. Straight Bed. (Choice of two.)
PROGRESS 8in. by 60in.; 23 to 1,050 r.p.m. Gap Bed.
LANG 8in. by 40in. Gap Bed.
WILLSON MKV 15¾in. swing (NEW)
HOLBROOK 6¼in. by 48in.; 15 to 400 r.p.m. Straight Bed.

NORTON MACHINE TOOLS BORERS

HORIZONTAL
PEARN RICHARDS No. 3.
RICHARDS HB.2A 3in. Travelling Spindle (choice of four).
RICHARDS HBF.1 2¼in. Travelling Spindle and Facing Head.
KEARNS OC 2¾in. Travelli Spindle (Choice of three)
VERTICAL
CRAVEN 36in. heavy du side head, elevating cr rail, rapid feeds.
JIG
NEWALL No. 0 Rebuilt makers.

NORTON MACHINE TOOLS MILLING MACHINES

UNIVERSAL
VICTORIA U.3 Table 60in. by 12¼in.; 20 to 1,020 r.p.m. NEW.
VICTORIA M.2, Table 40in. by 10in.; 25 to 450 r.p.m.
PLAIN HORIZONTAL
MILWAUKEE 3H, table 64in. by 13¾in.; 20 to 1,000 r.p.m.
MILWAUKEE 2K, 15 to 1,500 r.p.m. (Choice of two.)
ARCHDALE 20in. table 40in. by 10in., 60 to 1,230 r.p.m. Rapid Production.
CINCINNATI 2/24 Production.
CINCINNATI 08, table 18¼in. by 6¼in.; 75 to 1,100 r.p.m. Production. (Choice of two.)
BROWN & SHARPE No. 2B table 50in. by 12in.; 15 to 276 r.p.m.
ADCOCK & SHIPLEY Rack Feed Model OO.
ADCOCK & SHIPLEY Rack Feed Model O.
VERTICAL
HERBERT 28V table 85 by 28in.; 12 to 360 r.p.m.
HERBERT 47. 21 to 750 r.p.
CINCINNATI 4 HP tab 78¼in. by 16¼in.; 17 to r.p.m. (Choice of two.)
CINCINNATI No. 4 tab 78¼in. by 16¼in.; 18 to 4 r.p.m. Power down fe (Choice of 2.)
CINCINNATI No. 3 D Type, table 62¼in. by 15¼i 18 to 450 r.p.m.
CINCINNATI No. 2 tab 52¼in. by 12¼in.; 20 to 5 r.p.m.
ARCHDALE 18in. table; 38i by 10in.; 79 to 2,000 r.p.
PLANO
KENDALL & GENT tab 5ft. 0in. by 4ft. 0in. 4ft. 6in.
KENDALL & GENT tab 5ft. 0in. by 4ft. 0in. by 3ft. 6in.
PROFILE
MOREY No. 2.

REVERSE THE CHARGE
TELEPHONE: TATe Gallery 0633/6 **MERCHANTS**

W. E. NORTON

GROSVENOR GARDENS HOUSE **GROSVENOR GARDEN**

When answering advertisements kindly mention MACHINERY.

THE BULK PURCHASE

FEBRUARY 137 MACHINES— —NOW 150 MACHINES

% BELOW CURRENT SALE ROOM PRICES

DEAN, SMITH & GRACE · DEFIANCE · DENN · GLEASON · GISHOLT · HASSE & WREDE · HEINEMANN · HENDY · HERBERT · HOLBROOK · KEARNS · KENDALL & GENT · LANDIS · LIBBY · LUMSDEN · MAAG · MILWAUKEE · MONARCH · NORET · NEWEY · NORTON · ORCUTT · ORMEROD · PEARN RICHARDS · PROGRESS · RICHARDS · RHODES · ROCKFORD · SCULFORT · SWIFT · TAYLOR & CHALLEN · TAYLOR TAYLOR & HOBSON · VICTORIA · WARD

DRILLS

RADIAL

ARCHDALE 4ft. 0in.; 60 to 1,500 r.p.m. (Choice of four).
ASQUITH ODI 4ft. 0in.; 16 to 430 r.p.m.
ASQUITH ODI 4ft. 0in.; 31 to 850 r.p.m.
ASQUITH 4ft. 6in.; 31 to 850 r.p.m. (choice of two).
KITCHEN & WADE 4ft. 0in.

SINGLE SPINDLE

POLLARD CORONA ⅞in. cap.; 642 to 12,040 r.p.m. Bench. (Selection of several).
ASQUITH 2in. Cap; 31/850 r.p.m. Column (choice of two).

MULTI SPINDLE

BARNES DRILL 16 Sp. ⅝in. Cap.
ARCHDALE 12 Sp. ⅝in. Cap. F Cluster. (Choice of two.)
POLLARD CORONA Model HEF. 4 Sp. ⅞in. Cap; 642 to 12,040 r.p.m. Bench. (Choice of two.)

GRINDERS

CHURCHILL 20in. by 96in. Hyd. Cylindrical S/N 20468.
NEWALL 10in. by 36in. Plain Cylindrical.
MYFORD 9in. by 5in. MG9 Cylindrical.
LANDIS 3⅛in. by 18in.
CHURCHILL 16in. by 72in. Universal.
CHURCHILL 12in. by 50in. Hyd. Universal, internal spindle.
NORTON 12 by 48in. Universal.
FITCHBURG 12in. by 32in. Universal.
JONES & SHIPMAN 16in. by 8in. Universal, internal spindle.
CHURCHILL 42in. swing, 120in. bore Internal.
HEALD 81 Internal Gagematic Automatic Chuck Grinder. Serial No. 18601.
HEALD Model 81 Internal Plain.
HEALD 72A3 Plain Hydraulic, Internal.
LUMSDEN 24in. dia. Retractable Rotary Table Surface Model 90RT. With Chuck.
GALMEYER & LIVINGSTONE 36in. by 12in. Surface.
JONES & SHIPMAN 18in. by 6in. Model 540 H Surface.
FITCHBURGH 48in. Spline.
DEMM 36in. Spline M.A.T.R. NEARLY NEW.
ORCUTT 20in. Spline.
CHURCHILL 8in. by 16in. Tool and Cutter.

GEAR MACHINES

GEAR MACHINES

GLEASON No. 24 Straight Bevel Generator S/N 17920.
MICHIGAN Gear Lapper. S/N 2280.
MAAG SS60X Max. Dia. 17½in.; Max. DP2 S/N 3949 UNUSED.
FELLOWS Model 712/7 type HS Spur Gear Shaper S/N 24766.

VARIOUS

BARNESDRILL 6in. by 45in. Vertical Honer.
BARNESDRILL 5in. by 25in. Vertical Honer.
RHODES 75 Ton Double Sided Single Geared Press, fitted with Worsam air cushion.
TAYLOR & CHALLEN 20 Ton Presses. (Choice of two.)
DENBIGH Nos. 2 and 4 Fly Press.
BUTLER 24in. Heavy Duty Production Type Slotter.
BUTLER 12in. Stroke Slotter with tilting table.
ORMEROD 8in. stroke Slotter.
TAYLOR TAYLOR & HOBSON Engraver.
ROEBUCK No. 2 Riveter.
CROSSLEY Rifling Machines. (Choice of two.)

REMEMBER
W. E. NORTON (MACHINE TOOLS) LTD.
PAY HIGH WHEN BUYING
PRICE LOW WHEN SELLING

MEMBER B.A.M.T.M.

TELEPHONE VICtoria 7487

(MACHINE TOOLS) LIMITED

LONDON S.W.1 CABLES: NORBROS LONDON, S.W.I.

When answering advertisements kindly mention MACHINERY.

W2

Classified Advertisements (*PLANT FOR SALE, contd.*)

RING BELLS for machine tools

LEEDS 63-7398

POLLARD Horizontal High Speed Drill. Model 15 HF. Cap. ¾in. Swing over bed 15in. dia. Admits 12in. between chuck and loose head. M.D. 400/3/50.

AVEY 2-spindle Sensitive Drill. No. 2 M.T. M.D. 220/440/3/50.

MINIMUS Gear Hobber. Similar to Mikron 79. M.D. 400/3/50.

NEW UNION Model G.14. Double-Ended Grinder. Wheel 14in. by 2in. M.D. 400/3/50.

NEW UNION Model G.15. Double-Ended Grinder. Wheel 12in. by 1½in. M.D. 400/3/50.

JONES & SHIPMAN 12in. by 36in. Plain Grinder. Variable hydraulic table feeds. Admits grinding wheels 14in. dia. by 1½in. face. M.D. 400/3/50.

HUNT Model 1A Twist Drill Grinders. Cap. ¼in.-1in. M.D. 400/3/50.

MASSEY 5 cwt. Clear Space Pneumatic Hammer. 141 blows per minute. 25 h.p. motor 400/3/50.

CARTER & WRIGHT No. 4 Dual Feed Keyseater. T-slotted table 38in. by 12in. Cuts keyways up to 30in. by 1¼in. M.D. 400/3/50.

HERBERT No. 4 Capstans. Swing over flamard bed 15in. Speeds 30-750 r.p.m. M.D. 400/3/50.

MONARCH 18in. by 48in. S.S. & S.C. Lathe. Flamard bed. Taper turning. M.D. 400/3/50.

WARD 7B Combination Turret Lathe. Covered bed. Speeds 50-1,000 r.p.m. With ball chuck, bar feed, etc. M.D. 400/3/50.

VAN NORMAN Model 2LP Plain Horizontal Miller. Table 45in. by 10in. Long power traverse 28in. Quick power all ways. 18 speeds 30-1,450 r.p.m. M.D. 420/3/50.

FRITZ WERNER Model 8101 Manufacturing Miller. Table 36in. by 12in. Long. traverse 20in. 16 speeds 45-2,240 r.p.m. by change gears with fully automatic cycle. M.D. 415/3/50.

ARCHDALE 30in. Vertical Miller with Power Operated Rotary Table. Table 47in. by 14½in. Long. traverse 34in. M.D. 400/3/50.

SWEENEY & BLOCKSIDGE No. 7 Inclinable Power Press. Tonnage rating 10. Fixed stroke 1in. Bed area 18½in. by 12in. Bed to guides 7in. Hole in ram 1½in. M.D. 400/3/50.

BLISS Model L306, Double Sided, Double-Geared Power Press. Tonnage rating 135. 10in. stroke. Daylight 20in. Bed area 26in. by 26in. M.D. 400/3/50.

SAMSON Shear, Punch, Angle Crop and Notcher. Steel construction. Shears ⅞in. thick; punches ⅞in. through ⅜in.; crops up to 2½in., etc.

H. BELL (Machine Tools) LTD., Walter Street, LEEDS 4.

DIMCO

3a **WARD** Bar Feed Capstans.
54in. × 16in. **RICHARDS** Keyway Slotter.
59in. × 16in. **CRAVEN** Victoria Milling Machine.
New 60 Ton **DIMCO** Open Fronted Inclinable Adjustable Stroke Power Press.
New 42in. × 10in. **DIMCO** Model CM60 Universal Milling Machine. Power feeds and rapids.
New 10in. × 18in. **GER** Model 450 Hydraulic Universal Grinding Machines.
2A **MINGANTI** Capstan Lathes.
55in. × 13in. **CRAVEN** Universal Milling Machine.
35in. × 10in. **FRITZ WERNER** Production Milling Machine.
New 51in. × 11¼in. **LAGUN** Universal Milling Machine. Power feeds and rapids.
New 40in. × 11in. **DIMCO** Model FV2 Vertical Milling Machine. Power feeds and rapids.
No. 3 **GISHOLT** Bar Feed Capstan Lathe with equipment.
No. 2 **WARNER & SWASEY** Capstan Lathe. Chucking.
43in. × 12in. **FRITZ WERNER** Vertical Miller. Swivelling head.
20in. **ARCHDALE** Plain Miller. Power feeds and rapids. Spindle speeds 60-1,230 r.p.m.
20in. **ARCHDALE** Plain Miller. Power feeds and rapids. Spindle speeds 30-615 r.p.m.
No. 3 **KITCHEN & WADE** Honer.
No. 2 **KITCHEN & WADE** Honer.
11in./16in. **NOBLE & LUND** Hydraulic Cold saw with Hydraulic clamp.
Model HBY **CHURCHILL** Electrical Grinder.
14in. **BUTLER** Slotter. Power revolving table.
No. 3 **RICHARDS** Horizontal Borer Model PRT3.
No. 3 **KEARNS** Horizontal Borer.
No. 2 **KEARNS** Horizontal Borer.
16in. **CRAVEN** Lathe, 20ft. between centres.
54in. × 15in. **CRAVEN** Universal Milling Machine.
HERBERT S.E. Capstan Lathe.
4A **LIBBY** Turret Lathe.
CRAVEN Worm Milling Machines.

DIMCO (Gt. Britain) Ltd.,
28, WOOD LANE,
SHEPHERDS BUSH,
LONDON, W.12
SHEpherds Bush 4401/2

AH

USED MACHINE TOOLS in stock

NORTON Universal Grinding Machines sizes 12in. by 36in. and 14in. by 36in.
LEES-BRADNER Thread Milling Machines. Capacities of 6in. by 36in., 12in. by 24in. and 12in. by 102in.
KITCHEN & WADE Hydraulic Honing and Lapping Machines. Capacities of 2in.—9in. dia. by 25in. long.
FELLOWS 3in. Fine Pitch Gear Shaping Machine.
FELLOWS No. 8M Red Liner Gear Piston Machines. Capacity 8in. dia.
MICHIGAN No. 900 Gear Shaving Machine. Capacity 8in. dia. by 2in. wide.
ROCKFORD 12in. Hydraulic Shaping Machine.
ORMEROD 24in. Shaping Machine.

ALFRED HERBERT LTD.
RED LANE WORKS COVENTRY
Telephone: 89221

Kitchen & Wade G.5 6ft. Girder Radial, 3 Feeds and 3 Speeds. Machine No. 13642. Further details from: C. & G. OLDFIELD, LTD., 15, Abercorn Street, PAISLEY. Member of B.A.M.T.M.

Town Type AEO Radial Drill, 42in. arm, No. 3 M.T., elevating swing away table, low "T" slotted base, saddle mounted motor, 400/3/50 reversing switchgear, modern machine in excellent cond.—C. L. THOMAS, LTD., Stirling Road, Solihull. Tel. 3075-6.

Broadbent 10ft. 0in. Vertical Boring and Turning Mill. Raised Column to give 88in. under Toolholder. New 1959 and in new condition.

Further details and full quotation from: C. & G. OLDFIELD, LTD. 15, Abercorn Street, PAISLEY

DOUBLE CRANK PRESS

Rhodes 100 Ton Double Geared. Table size 5ft. × 3ft. 6in. Motorised, guarded, 4in. stroke. For sale cheap. Room wanted quickly.—BOX D207, MACHINERY, Clifton House, Euston Road, N.W.1.

CHURCHILL REDMAN 32in. Heavy Duty Shaper. 8 ram speeds 8-104 SPM. 11 Auto feeds. Table top area 32½in. × 16in. 400/3/50.
SMITH & MILLS 26in. Heavy Duty Shaper. 8 ram speeds 8-100 SPM. 15 Auto feeds, rapid traverse swivel base vice, 400/3/50.
ARCHDALE 28in. All Purpose Horizontal Milling Machine. Table size 38in. × 13in. Power and Rapid Power traverse all ways. Spindle speeds 30 to 462 r.p.m. 400/3/50.
ACME GRIDLEY Type RA86 1in. Capacity 6 Spindle Automatic. Screwing and Drilling Attachments. Excellent condition. 400/3/50.
B.S.A. Type RA Gridley 1¼in. Capacity 6 Spindle Automatic. Universal threading attachment. 5th position parting off slide. Late model, extensive equipment.
ALEXANDER 2A Universal Die Sinking Machine. Table size 14in. × 8in. Copy table 12¼in. × 17¾in. Ratio 1¼-1 to 10-1. 10 spindle speeds 1,900 to 15,000 r.p.m. 400/3/50. Complete with equipment and Universal Cutter Grinder.
H.M.E. Type L 40 Ungeared Open Front Inclinable Power Press. Pressure 40 tons, Adjustable stroke ¼in. to 4in. Bed area 29½in. × 21½in. 400/3/50. Operator's Guards.
RUSHWORTH Geared Overcrank Power Guillotine. Capacity 10ft. × ¼in. m.s. 20 Strokes per minute. Motorised 15 h.p. 400/3/50. Complete with automatic hold-down, front and rear gauges, fully guarded and spare set of blades.
RHODES No. 12 Double Sided, Double Crank, Geared, Power Press. Pressure 70 tons. Fitted fixed stroke 4in. Bed area 44in. × 42in. 400/3/50.

STANCROFT LTD.,
LANCASTER STREET, BIRMINGHAM, 4
ASTon Cross 2235.

When answering advertisements kindly mention MACHINERY.

ROLLS TOOLS LTD.

OF WOKING SURREY

AUTOMATICS

B.M.W.13 13mm. single spindle.
PITTLER 12mm. Swiss type.
AE8 BECHLER 4 tools, 2 spindle attachment, slotting attachment.
AE4 BECHLER 1 spindle attachment.
2 GIBBS Swiss Type ⅜in. Capacity.
2B BROWN & SHARPE 3 slide machines, 1¼in. capacity, 8,000 series.
CLEVELAND Model A. 2¼in. capacity.

MULTI SPINDLE AUTOMATICS

⅞in. **B.S.A. ACME GRIDLEY** RA6 spindle. Screwing spindle, Collets and Tooling. 3 available. 1944-1948.
1¼in. **CONOMATIC** 8 spindle with screwing spindle, thread rolling, tooling and collets.
1in. **NEW BRITAIN GRIDLEY** 6 spindle, Model 60.
1⅜in. **ACME GRIDLEY** 6 spindle Bar Auto.
⅞in. **ACME GRIDLEY** 4 spindle, G Model Bar Auto (Cheap)

COMPRESSORS

New **B.E.N.** Compressors in stock, type VR 32 CFM, 100 lb. working pressure and type VR 41 CFM 100 lb. working pressure.

CUTTING OFF MACHINES

BALLINGER Abrasive type C.
CLIFTON & BAIRD Cold Saw, Hydraulic feed. Saw 18in. dia. and clamp.

DRILLS

HERBERT J TYPE. Single Column and two column machines.
ARCHDALE Snout Type Electrically Controlled Vertical Borer. 50 Int. Taper.
LELAND GIFFORD 2 Spindle No. 2 Morse Taper.
ASQUITH Horizontal Duplex M/c. No. 5 Morse, 5ft. dia. Rotary table.
ARCHDALE 3 Spindle, No. 2 Morse taper, pole change motors to each spindle.

RADIAL DRILLS

KITCHEN & WADE 40in. Arm. Power Rise and Fall. Speeds 1,500 r.p.m., No. 3 Morse. Suds.
TOWN 5ft. Radial.
ARCHDALE Light Sensitive 36in. Rise and Fall Table. No. 3 Morse.
ASQUITH 6ft. D.C. Drive—Cheap.

GEAR HOBBING MACHINES

PFAUTER type R00 and RS0.
MIKRON type 79.
CLEVELAND 130D.
BARBER COLMAN No. 3.
GLEASON 3in. Bevel Gear Generator and equipment.
LORENZE SOO High Speed Gear Shaper, Rebuilt.

GRINDERS—CYLINDRICAL

PRECIMAX SP 1½, 7in. by 12in.
PRECIMAX MPO., 6in. by 24in. Plunge
NORTON 6in. by 24in.
CHURCHILL 6 by 18 Hydraulic feed, hydrauto bearings.
CHURCHILL 10in. by 48in.

GRINDERS—SURFACE

SNOW VB.18, 72in. Traverse by 15in. wide.
DOALL 20in. by 6in. Hydraulic Feed.
JONES & SHIPMAN Fig. 540. 6in. by 18in.
BLANCHARD 10C. 16in. Magnetic Rotary Table.

GRINDERS—UNIVERSAL

JONES & SHIPMAN 10in. by 27in.
LANDIS 12in. by 36in.
HENRI KAESER Model L. 10 by 20.
BROWN & SHARPE No. 13.

LAPPING MACHINES

HAHN & KOLB 26in. dia. with Coolant Filter Plant.
PETER WOLTERS Hydraulic. Two Spindle Vertical Honing Machine.

LATHES

BINNS & BERRY A.G.H. 10in. centres & 6ft. between, 36in. in gap. Speeds 22-490.
PRATT & WHITNEY A.G.H. 6½in. by 30in.
TRIDENT Gap Bed Lathe. 6½in. by 30in.
WARD HAGGAS & SMITH faceplate Lathe, 57in. swing, 64in. in gap. Short bed with adjustable gap.
LE BLOND Production Lathe, 7in. centres by 36in. between.
TRIDENT Gap Bed 6½in. by 60in.
TRIDENT 6½in. by 60in.

CAPSTAN AND TURRET LATHES

HERBERT No. 4
HERBERT No. 0.
HERBERT No. 13 Bar Turret.
GISHOLT No. 3 A.G.H. Capstan (Collet).

Capstan and Turret Lathes (cont.)

GISHOLT No. 3 Simplified Capstan.
MODERN No. 1.
WARNER & SWASEY No. 1.
WARD No. 8 Combination covered bed, chucking.
WARD No.7 Combination. Uncovered Bed.
WARD No. 7 Capstan Lathe, covered bed, air chucking.
WARD 3A Capstans.
WARD 2A Capstans.

MILLING MACHINES

CINCINNATI 08 Vertical.
THIEL Model 58 Tool Room Mill.
WADKIN High Speed Vertical, Table 35in. by 13in.
OERLIKON SV 3 Vertical swivel head.
CINCINNATI No. 3 Vertical Sliding head.
ALEXANDER No. 2, 3 Dimensional Pantograph Machine.

MILLERS THREAD

HILLE 6in. O/D Max.
MATTERSON No. 11.
HANSON WITNEY 9 in. by 4in.
WICKMAN Moulton.
ARCHDALE with 120 Hobs.
WANDERER. 3in. capacity.

PRESSES

TAYLOR & CHALLEN Type 1413 40 ton Variable stroke—Guards.
85-ton **RHODES** Upright Geared.
16-ton **RHODES** Inclinable.
25-ton **RHODES** Inclinable.
35-ton **RHODES** Inclinable.
BLISS No. 8 Power Press.
FLY PRESSES Nos. 3, 4, 5, 6.
FLY PRESSES Horning, No. 4.
HENRY & WRIGHT Dieing Press, 25 tons.
L.M.E. 20-ton variable stroke operator's guard.

SHAPERS

ESSEX Punch Shaper with Microscope and equipment.
ROCKFORD 28in. Hydraulic Universal.
INVICTA 6M 24in. stroke.
ALBA 4S 18in. stroke.
ALBA 10in. stroke.

SLOTTERS

BUTLER RAPID 8in. Tool Room Machine.
BUTLER PRECISION 4in.

All Electrics 400/3/50.

ROLLS TOOLS LTD. No. 1 Factory, Pyrford Road, Pyrford, Woking

Contact Mr. P. W. Gander Telephone: Byfleet 43252/3 & 41456

PIDGEN BROS. LIMITED

HELMET ROW, OLD STREET, LONDON, E.C.1

Telephone: CLErkenwell 6481

ALL MACHINES MOTORISED FOR 3 PHASE SUPPLY UNLESS OTHERWISE STATED

AUTOS
WICKMAN 10 mm.
GREENLEE 1in. × 6 spindle.
BORERS Horizontal)
KEARNS No. 2.
BROACHING
AMERICAN model H2, stroke 30in.
CAPSTANS
MITTLER type RGII 82.
MURAD ¾in.
HERBERT 4B and 4.
CUTTING OFF MACHINES
TAYLOR 10in.
DRILLS
NATCO 24 spindle No. 1 M.T.
CORONA Type 15CX 2 spindle.
HERBERT 2 spindle.
MONMOUTH 4 spindle No. 2 M.T.
ARCHDALE 3ft. Radial No. 3 M.T.
DENBIGH 24in. B.G.
HERBERT "C" Power Feed.
CORONA No. 21 AR, No. 3 M.T.
JONES & SHIPMAN 816, ⅞in. cap.
CORONA IAX, No. 1 Morse Taper.
LELAND GIFFORD 2-sp., No. 2 M.T.
HERBERT Type B. Single Spindle, ¾in.
CORONA 6MX Cluster Type.
HERBERT Type H, ¼in. cap.
ENGRAVERS
T.T. & H. 3 dimensional.
ALEXANDER No. 2, 3-dimensional.
LIENHARD 3-dimensional. (New.)
LIENHARD No. 1H.
HUPFIELD Router.
T.T. & H. Type C, C.B. and M.A.
T.T. & H. Multi Etcher.
FILING AND SAWING MACHINES
JONES No. 13 Bandsaw.
WICKSTEAD No. 1 Hacksaw.
RAPIDOR 6in. Hacksaw.
RAPIDOR Filing.
FOLDERS
Sheet Edging, 30in. × 22g.
GEAR CUTTERS
SAFAG Pinion.
MAXICUT 7in. × 2in. × 6 D.P.
PETERMAN No. 1 and 2.
GRINDERS (Internal)
CHURCHILL HBY.
BRYANT 16/38 and 5.

GRINDERS (Surface)
CHURCHILL OSB 8in. × 30in.
LUMSDEN Vert. 210 XXM.
ABRASIVE No. 34 Vertical Spindle.
GRINDERS (Cylindrical)
CHURCHILL 6 × 36in. B.Y.
CHURCHILL PBH 12 × 36in. Univ.
NEWALL 6 × 18. Model XL.
GRINDERS (Miscellaneous)
BROWN & SHARPE No. 10 and 13 T. & C.
J. & S. "Perfect Point" 0·010in.-¾in. Drill.
JONES & SHIPMAN, 10in. × 27in. T. & C.
J. & S. Drill, ¼in. to ⅞in.
STEDALL WUNDERLI Carbide.
ROWLAND 12in. × 2in. Single Wheel.
WICKMAN NIVEN Carbide.
WADKIN Saw Sharpener.
JACKMAN D/E 18in. Disc.
EXCEL Model OS. T. & C.
TURNER 14/20 20in. × 3¼in. wheels C/E.
NEWALL 420 Univ. Threads.
HUNT No. 0 and 1 Tap Regrinders.
HUNT No. 0, 2 and 3 Drill.
CHURCHILL Valve.
HONER
DELAPENA 4-speed.
KEYSEATERS
BENTLEY 5in.
ASQUITH H.K.O. Horiz. Duplex.
EDGWICK 4in.
LATHES
DEAN, SMITH & GRACE 7in. S.S. & S.C.
CHURCHILL Cub, 6in. × 24in. S.S. & S.C.
SOUTHBEND 13in. S.S. & S.C.
DENHAM 4½in. × 24in. S.S. & S.C.
LE BLOND Production, 11in.
RIVETT S.S. & S.C. 4in. Model 602.
SOUTHBEND 10in. Toolroom.
WILLSON 7¼in. × 36in. S.S. & S.C.
MONARCH 10EE × 22in. S.S. & S.C.
SMALLPIECE 9SW Multi-tool.
RIVETT 3¼in. Plain. Model 715.
WARD, HAGGAS & SMITH 8¼in. × 78in.
RYDERMATIC No. 12 Multi Tool.
BERRY 6¼in. × 36in. S.S.& S.C.
MISCELLANEOUS MACHINES
LUKE & SPENCER 38in. × 4 HP Polisher.
CANNING 54in. × 2 HP Polisher.
Dust Extractors, Various.

MILLERS (Horizontal)
DENBIGH C4. Table 46 × 10.
CINCINNATI O8 Production.
CINCINNATI 1/18 Production.
ROSCHER EICHLER. Table 39in. × 12 in.
ST. ANDREA Model UFO3 Table 57 × 14.
KENT OWEN 1/8 Production.
HARDINGE Precision. Table 25 × 6½.
WERNER. Table 14 × 5.
JONES 225 Univ. Table 22 × 6.
ARCHDALE 20in. dial and 14in. mfg.
RICHMOND O3. Table 40 × 10.
U.S. Multi Mill.... Production.
MILLERS (Vertical)
REED PRENTICE No. 2.
BROWN & SHARPE No. 2 Light.
C.V.A. 79 Tool and Die.
REED PRENTICE No. 5, 68in. × 16in. table.
WADKIN Type LXIA. Table 36in. × 13in.
PRESSES (Power)
BESCO BA 20. Adj. Str.
BLISS No. 18. Adj. Str.
BLISS No. 16 Bar.
LECRA No. 8. 4 tons.
WRIGHT Clicking Press.
PROFILING MACHINE
CURDNUBE 2 Spindle. Model KIV.
RIVETERS
HIGH SPEED Hammer, 7/16 cap.
TURNER RH18 (¼in.), RH38 (⅜in.), RH34 (⅜in.), RH14 and 14/12 (½in.).
SCREWING MACHINE
ATLAS No. 2, 3in.-6in. (Unused.)
SHAPERS
INVICTA 10in.
NEWEY 14in.
SHEET METAL MACHINES
BESCO 12in. and 16in. Treadle Guillotines.
FROST 6in. × ⅛in. Power Guillotine.
BESCO 21in. × 14in. Rolls.
BESCO 48in. Power Guillotine.
SLOTTERS
EDGWICK.
TAPPERS
ESSEX No. 24, ¼in. cap.
ACE Horiz., ¼in. cap.
J. & S. Electrotap, ¼in.
THREAD MILLERS
WICKMAN MOULTON 1B.

Kitchen & Wade H5 Horizontal Boring and Drilling Machine, complete with Square Box Table and Auxiliary Revolving Table. Machine equal to new.

Further details from —
C. & G. OLDFIELD, LTD.,
15, Abercorn Street,
PAISLEY

Krauseco Four Spindle, Upstroking, fine Borer, 400/3/50. Adjustable centres.—HICKS MACHINERY LTD., 26, Addison Place, London, W.11. Tel.: PARk 2333.

Adcock & Shipley 5-Spindle Drill, adjustable drill heads, ¼in. cap., 400/3/50.—A. McNAMARA & CO., LTD., New Line, Bacup, Lancs. 'Phone: Bacup 946.

Herbert No. 4BS Capstan Lathe, fully rebuilt and guaranteed. Chuck model.

Further details from —
C. & G. OLDFIELD, LTD.,
15, Abercorn Street,
PAISLEY

Asquith 8ft. (No. 4 type) radial drilling machine, **No. 5 Morse Taper,** 18 spindle speeds 15-775 r.m.p., **Vertical Max. Movement** (power) 5ft. 2in., loose box table, **Power Auto Arm Lock,** 1949 machine, **excellent condition.**

Gribben-Davies (Machine Tools) Ltd
Turner St., Suffolk Road, Sheffield, 2

SOAG

ASQUITH HORIZONTAL BORER
Floor Type NHB3 IN STOCK!

MAIN DATA:—

Spindle dia.	5¼in.
Morse Taper	No. 6
Horiz. travel Column	12ft.
Vert. travel Workhead	8ft.
13 sp. speeds	5.2-250 r.p.m.
Spindle Motor	12½-h.p.

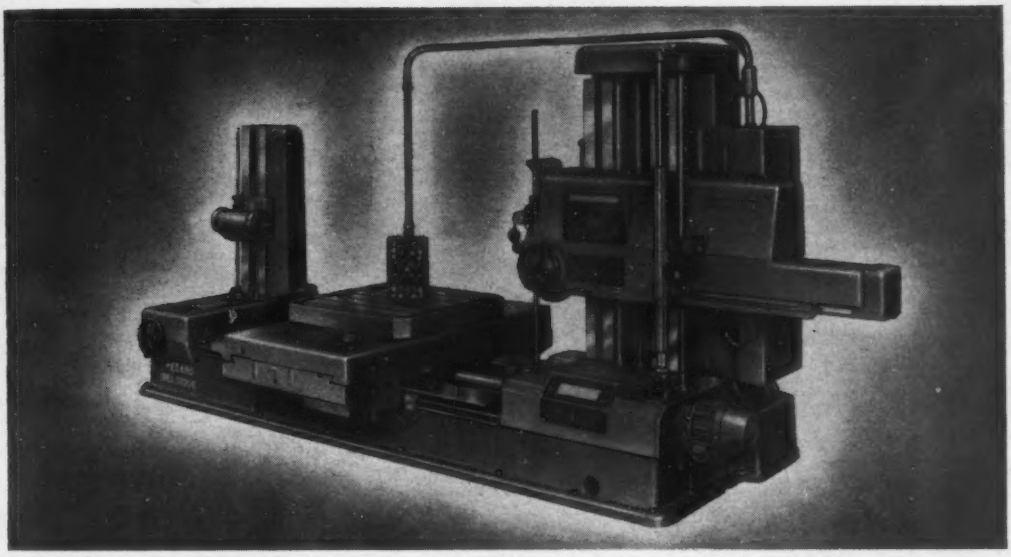
This travelling Column Borer, built in 1937, has multi motor drive and is in sound condition throughout. Inspection invited.

Full details from:- **SOAG MACHINE TOOLS, LTD.,**
7, Juxon Street, Lambeth, London, S.E.11.
'Phone Reliance 7201. **Grams: Sotoolsag, London. S.E.11.**

One Secondhand Scrivener No. 1 Centreless Grinding Machine, maximum capacity 1¼in. diameter with Plunge Feed. Hand Operated. Motorised 400-440/3/50.
C. & G. OLDFIELD, LTD.
15, Abercorn Street,
PAISLEY.

When answering advertisements kindly mention MACHINERY.

The NEW A.F. RANGE | PEGARD UNIVERSAL JIG BORING, BORING & MILLING MACHINES



AF10 100 mm spindle-speeds 18-900 r.p.m. or 28-1,400 r.p.m. AF 70 mm spindle-speeds 28-1,400 r.p.m.

STANDARD EQUIPMENT

• Pendant Control—machine controlled entirely from pendant including pneumatic engagements of speeds and feeds • Inching of rapid traverse and fine setting feed (·0004in. per impulse) • Automatic pneumatic locking to all motions • Fractional rotation of spindle and facing head • Pre-selection of speeds and feeds • Indicated and accurate optical reading of all traverse displacements and accurate indexing of rotary table (·0004in. and 6 seconds respectively) • Automatic depth release attachment for machining with spindle • Cutting speeds table and patent co-relating drum for speeds, diameters and cutting speeds • Pneumatic forced and splash lubrication.

EXTRAS AVAILABLE

• Facing head • Milling nose • Automatic accurate co-ordinate setting equipment for vertical headstock traverse and transverse table traverse (accurate repetition to ·0004in.) • Extended traverses, vertical, longitudinal or transverse.

ON VIEW FOR THE FIRST TIME!

AT THE 7th EUROPEAN MACHINE TOOL EXHIBITION, BRUSSELS.

DO NOT FAIL TO VISIT STAND No. 6203, HALL No. 6, BEFORE SEPTEMBER 12th.

For further details contact sole agents for U.K. :—

GEORGE COHEN SONS & CO. LTD.

THE 600 GROUP OF COMPANIES

SUNBEAM ROAD, LONDON, N.W.10.	STANNINGLEY WORKS, NR. LEEDS.	BELL STREET, WEST BROMWICH.
Tel : Elgar 7222.	*Tel : Pudsey 2241.*	*Tel : West Bromwich 2634.*

Classified Advertisements (PLANT FOR SALE, contd.)

Harry Kirk Eng. Ltd.

can recommend the following modern quality machines from STOCK

AUTOMATICS

WICKMAN 5in. Chucking Automatic.
RYDER Verticalauto. capacity 16in. swing × 8in., 6 spindles.

BORING MACHINES

KEARNS O.B. Horisontal Boring Machine. 2¾in. Spindle. Spindle Speeds 15/600 r.p.m. Excellent condition.
RICHARDS 36in. Vertical Boring Mill, complete with side head.
JONES 6in. Spindle Horizontal Borer. Table 17ft. 6in. × 8ft. Spindle travel 48in. Rapid traverse 84in. per min. Motorised 400/3/50. Weight 70 tons.
BULLARD 36in. Vertical Boring Mill.
KITCHEN & WADE Vertical Fine Boring Machine, 14in stroke. Compound table.

DRILLING MACHINE

ARCHDALE 8-Spindle Hydraulic Vertical Drilling Machine.

GRINDING MACHINES

BROWN & SHARPE No. 2 Surface Grinder 18in. × 6in. table.
KELLER No. R6 Tool and Cutter Grinder.
HEALD No. 172 Gap Bed Internal Grinding Machine, maximum diameter of component 36in.

LATHES

N.D. 8in. × 6ft. S.S. & S.C. Lathe. 30in. between centres.
SMALLPIECE Lathe, type 6 WSLMS.
NOBLE & LUND Heavy Duty Centre Lathe. 22in. centre height × 29ft. between centres Max. swing over saddle 33in. dia.
HARVEY Heavy Duty Centre Lathe. 42¼in. centre height × 52ft. between centres Max. swing over saddle 65in. dia.

MILLING MACHINES

EDGWICK No. 2 Universal Milling Machine. Working surface of table 38in. × 7¼in.
BROWN & SHARPE No. 3A Universal Milling Machine with Vertical Head Attachment. Spindle Speeds 30/1,200. Power feed all movements.
COLLET & ENGLEHARDT Keller Type Die Sinking Machine Model FKf80, capacity 60in. × 30in

PLANING MACHINES

CLEVELAND Openside Planing Machine, capacity 10ft. × 2ft. 6in.
CINCINNATI Planing Machine, capacity 8ft. × 2ft. 6in

MISCELLANEOUS MACHINES

Hydraulic Vertical Internal Honing Machine (manufactured by **PETER WOLTERS**), Capacity 0.2in. to 2in.
RAPIDAN Double Helical Gear Generating Machine, 12in. diameter capacity

Further details from

HARRY KIRK ENGINEERING LTD.,
BRANDON ROAD WORKS, BRANDON ROAD, COVENTRY

'Phone:
WALSGRAVE-ON-SOWE 2253 (6 lines).

Cincinnati No. 2 M.H. Plain Horizontal Milling Machine, W.S.O.T., 7in. × 44in.

Further details from:—
C. & G. OLDFIELD, LTD.,
15, Abercorn Street,
PAISLEY.

SERVICE EDWARDS VALUE!

BESCO Eccentric Power Punching Press. Motorised for 440-440/3/50 supply. Pressure exerted approx. 8 tons. Stroke adjustable from ¼in. to 1¼in. Bed 11¼in. by 8¼in. Hole in bed 4¼in. by 3¼in. Weight approx. 720 lb.

NEW MODEL BU.100 Universal Double Ended Punching, Shearing, Section Cropping and Notching Machine. All-steel construction, Motorised for 400/3/50 supply. Shears plates up to ⅜in. Flat bars up to 1in. × 6in., rounds up to 2¼in., square bars up to 2in × 2in. Punches up to 1¼in. diameter through ⅜in. Square notches plate up to ⅜in. thick. Weight approx. 80 cwt.

NEW **MUBEA** All-Steel Construction Bar and Angle Shear. Motorised for 400/3/50 supply. Fitted with electro-magnetic clutch and brake. Capacity:—rounds 2in., square 2in., flats 10in. × ¼in., or 5¼in. × 1in. Angles 4in. × ¼in., tees 5in., beams 6in., channels 6in. Supplied with sets of blades for flat bars, rounds and squares. Weight approx. 39 cwt.

NEW **BESCO** Motorised Plate Bending Roller. Suitable for 380-420/3/50 supply. With three steel rollers arranged tripod fashion. Top roller housing swings down for withdrawal of cylinders. Capacity mild steel 6ft. × ¼in. Dia. of top roller 5¼in. Bottom rollers 4¾in. Weight approx. 22 cwt.

KEETONA Universal Folding Machine. Capacity 73in. × ¼in. With balance weight and adjustable stop for repetition angle bending. Max. lift of top beam 2¼in. Max. radius with radius blades 1in. Weight approx. 46 cwt.

FOUR **BLACKBURN & CRAWSHAW** Power Operated Geared Rotary Shearing Machines. Capacity ¼in. thick. Depth of gap 20¼in. Cutters diameter × thickness 5¼in. × ¼in. Cutting speed 51ft. 6in. per minute. Arranged motor drive 400/3/50.

BRADLEY & CRAVEN Press Brake. Motorised for 400-440/3/50 supply. Max. pressure approx. 65 tons. Forming capacity 10ft. × 12 s.w.g. over die opening of ¼in. or 8ft. × ¼in. over die opening of 1¼in. Tee slotted bed. Length of bed and ram 120¼in. Width of bed 5in. Weight approx. 8½ tons.

Photographs of the above are available.

VERY FAVOURABLE HIRE OR HIRE PURCHASE TERMS CAN BE OBTAINED.

MACHINE TOOLS, NEW AND USED, Of Every Description. Attractive Prices.

F. J. EDWARDS LTD.,
359-361, EUSTON RD., LONDON, N.W.1

Telephone: EUSton 5000 Telex. No. 24264

And at Lansdowne House, 41, Water St., Birmingham, 3. *Telephone: Central 7606-8*

Richards No. 2 PRT Horizontal Boring and Facing Machine complete Live Spindle.

Further details from:—
C. & G. OLDFIELD, LTD.,
15, Abercorn Street,
PAISLEY

No. 9A Herbert M/D All-gd. Combination Turret Lathe. Covered vee bed. Swings 20¼in. dia. over bed. Roller bearing spindle bored 4¼in. dia. Admits 60in. spindle to turret. 16 spindle speeds 21-809 r.p.m.—LEE & HUNT, LTD., Crocus Street, Nottingham. 'Phone 84246.

Lang 20in. Surfacing and Boring Lathe, Chuck Model. Excellent Machine.

Further details from:—
C. & G. OLDFIELD, LTD.,
15, Abercorn Street,
PAISLEY.

DOUGLAS
OF HIGH WYCOMBE

NEW MACHINE TOOLS FOR EARLY DELIVERY

GRINDERS

BURDETT 70 18in. × 6in. hydr. Surface Grinder. (Oct. 1961)
JAKOBSSEN SJ.12 24in. × 10in. hydr. Surface Grinder. (Sept. 1961)
CLARKSON Tool and Cutter Grinder. (Sept. 1961)
EXCEL No. 5 Tool and Cutter Grinder. (Jan. 1962)
GHIRANGHELLI A.45 Centreless Grinder. (Dec. 1961)
GHIRANGHELLI A.50 Centreless Grinder. (Sept. 1961)
MYFORD MG.12 Cylindrical Grinder. (Oct. 1961)
RIBON RUR.500 Universal Grinder. (Jan. 1962)
RIBON RUR.1000 Universal Grinder. (Jan. 1962)

DRILLS

ARBOGA E.100SL 1in. cap. Pillar Drill. (Oct. 1961)
ARBOGA E.825 1in. cap. Pillar Drill. (Oct. 1961)
ARBOGA E.830 1¼in. cap. Pillar Drill. (Jan. 1962)
FLOTT TB.6/3 ¼in. cap. Bench Drill. (Oct. 1961)
PROGRESS 3A 1¼in. cap. Pillar Drill. (Sept. 1961)
PROGRESS 3E 1¼in. cap. Pillar Drill. (Dec. 1961)
PROGRESS 5E 2in. cap. Pillar Drill. (Dec. 1961) (with coolant and compound table).
PROGRESS 4-spindle Multi-Spindle Drill. (Nov. 1961)
ARBOGA ER.125S 1in. cap. Radial Drill. (Oct. 1961)
ARBOGA ER.825 1in. cap. Radial Drill. (Oct. 1961)
ARBOGA ER.830 1¼in. cap. Radial Drill. (Oct. 1961)
ARBOGA ER.1830 1¼in. cap. Radial Drill. (Nov. 1961)
PACERA A.10 ¾in. cap. Articulated Drill. (Sept. 1961)
RICHMOND SR.2 4ft. Arm Radial Drill. (Nov. 1961)
MAS VR.2 1¼in. cap. Radial Drill. (Dec. 1961)

LATHES

CARDIFF 7¼in. × 40in. S.S. & S.C. Lathe. (Sept. 1961)
CARDIFF 9¼in. × 48in. S.S. & S.C. Lathe. (Nov. 1961)
CARDIFF 9¼in. × 80in. S.S. & S.C. Lathe. (Sept. 1961)
COLCHESTER 8¼in. Mascot Lathe. (Oct. 1961)
CROWTHORNE 7¼in. S.S. & S.C. Lathe. (Nov. 1961)
HARRISON 13in. swing S.S. & S.C. Lathe. (Jan. 1962)
KERRY AG.2 5¼in. S.S. & S.C. Lathe. (Sept. 1961)
MAS SV.18R 7¼in. Precision Toolroom Lathe. (Sept. 1961)
MYFORD Super 7B 3¼in. Lathe. (Sept. 1961)
RAGLAN 5in. S.S. & S.C. Lathe. (Oct. 1961)
SMART & BROWN 1024 Precision Lathe. (Oct. 1961)
WILLSON 6¼in. MK. I Inclined Bed S.S. & S.C. Lathe. (Oct. 1961)
WILLSON 7¼in. Newel MK. V S.S. & S.C. Lathe. (Sept. 1961)
WILLSON 7¼in. Newel S.S. & S.C. Lathe. (Sept. 1961)
WOODHOUSE & MITCHELL 7in. 70 Junior Lathe. (Nov. 1961)

A. DOUGLAS CO., LTD.,
CRESSEX INDUSTRIAL ESTATE, LINCOLN ROAD, HIGH WYCOMBE, BUCKS.

Tel.: High Wycombe 4390 (10 lines).

MACHINES NOW IN STOCK

AUTOMATICS

MANURHIN Type PDI2A Automatic with Hopper feeds for parting off and chamfering Cartridge Case heads. 5 machines. (These nearly new machines may be adapted for other work and are offered at the lowest price.)
RYDERMATIC No. 18 Vertical Automatics 60 H.P.

BORING MACHINES

MATHEYS Model FPN/2B Semi Jig Borer. (1956.)
PADDON Mk. 3 type WP Cylinder Re-Boring Machines.

HONING AND LAPPING

WOLTERS Model I.L.I. Hydraulic Internal Lapping Machine.
DELAPENA Honing Machine.

CAPSTANS AND TURRET LATHES

BOLEY-LEINEN Model ER 15 ¼in. Capstan (Modern) (1953).
HERBERT No. 2 Pre-optive Bar Turret Lathe. Flamard bed, 2in. capacity with bar feed, full turret tooling.
HERBERT Model 22A Turret Lathe. 8¼in. Spindle Hole.
LIBBY 2H 8in. spindle Turret Lathe.
MURAD ¼in. with full equipment.

CENTRE LATHES

Two **WILLSON** 7¼in. Newel Lathes.
SOUTHBEND 7in. Centre Lathe.
CRAVEN Heavy Duty Railway Wheel Lathe, swing 6ft. by 12ft., vee belt drive. Weight 25 tons.
New **CAPITOL** 9¼in. Centre Lathe admitting 6ft. between centres.
FACEPLATE Lathe, 9ft. swing.
DEAN, SMITH & GRACE 9in. by 5ft. 6in. Centre Lathe.

GRINDING MACHINES

OLIVETTI Model R 4-500 plain cylindrical grinder (1953).
MOPCO Model RUP 108YW. Combination horizontal and vertical spindle toolroom hydraulic Surface Grinder, table 38in. by 11in. (1953).
ZENITH Model PH Horizontal Spindle Hydraulic, Surface Grinder, 24in. by 8in. (1953).
VICO (Swiss) Hydraulic Toolroom Universal Grinder 10in. by 30in. (1953).
CRAVEN Heavy Duty Roll Grinding machine with capacity for rolls 42in. dia. by 12ft. between centres and fitted with automatic cambering. Will take rolls up to 25 tons weight. Fully motorised machine of modern design. Weight 25 tons.
WALDRICH SIEGEN Roll Grinder. 36in. by 13ft. between centres.
LOTH Universal Grinder (new).
Two **CINCINNATI** No. 2 Tool and Cutter Grinding Machines.
COVEL No. 2 Tool and Cutter Grinding Machine.
IMPERIA Tool and Cutter Grinder, Model M6 AR. (1953).
MATRIX No. 16G Plain Straight Thread Grinder.
SCRIVENER No. 1 Centreless Grinder.
BLAKE No. 1 Tap Chamfering Machine (New).
MATRIX No. 6 Internal Thread Grinders 3in. by 10in.
HEALD Model 81 Sizematic Internal Grinder.
PETEWE Model 3D Profile Grinding Machine (Nearly New).

DIESINKING MACHINES

VICTORIA Duplomatic Hydraulic Copy Milling Machine, 8in. by 8in. (New).

DRILLING MACHINES

ASQUITH Model ODI Radial Drilling Machine 4 M.T.
PACERA ¼in. Bench Drill (New).
Two **ARCHDALE** 36in. Radial Drilling Machines. No. 4 M.T.

GUILLOTINES

BESCO 42in. by 10 s.w.g. Power Guillotine.
HANDS 4ft. by ¼in. Guillotine.
RHODES 6ft. by ¼in. Guillotine.

MILLING MACHINES

MILWAUKEE Model 5H Vertical Mill, dial type, high speed model with power down feed to head, table 94in. by 18in. (New price U.S. $36,680. This machine is in beautiful condition, offered at a fraction of replacement cost.)
FRITZWERNER Model 8101 Automatic Miller (1953).
EDGWICK No. 1 Horizontal Milling Machine 40in. by 10in. table.
DENBIGH Model No. C4 Horizontal Milling Machine.
SANT ANDREA Model U.F.O/5 Heavy Duty Horizontal Miller. 86¼in. by 19in. Table travel 67in. (1953).

. . . *a few yards from Olympia and Earls Court*

348-354 KENSINGTON HIGH STREET - LONDON - W. 14
WEStern 7031 (5 lines)

TATE

VICTORIA Junior Omnimil (New).
Two **ARCHDALE** 18in. Automatic Cycle Kneeless Production Millers.
SOMUA Model FH2C Horizontal Miller table 67in. by 14¼in. (1953).
CUNLIFFE & CROOM No. 2 Vertical Mill (dial).
FACKS Thread Miller.
ARCHDALE 34in. Plain Horizontal Miller (nearly new).
BEAVER Model VRBP Vertical Miller (New).

PLANING MACHINES

STIRK 16ft. by 5ft. double column Planers, four toolboxes; modern machines with Lancashire drive (Two).
HOLROYD Plano Mill 17ft. 6in. by 9ft. 6in.

POWER PRESSES

RHODES 1-Ton Open Fronted Bench Press with flange motor and UDAL guards.
LEE & CRABTREE 15-ton Horning Press.
LEE & CRABTREE 20-Ton Horning Press.
LEE & CRABTREE 35-Ton Double Action Mechanical Press.
RHODES 150-Ton Double Sided, Geared, Adjustable Stroke Power Press (1956).
H.M.E. Model DCP3 70-ton Double Sided, Double Crank, Single Action Power Press.
Three New **MULLER** Model AMP 22-ton Power Presses.
Three New **MULLER** Model AMP 35-ton Power Presses.
Two New **MULLER** AMP 45-ton Power Presses.
Two New **MULLER** AMP 60-ton Power Presses. Open Fronted.
Two New **MULLER** AMP 80-ton Power Presses.

SHAPING MACHINES

BERRY 16in. Shaper.
BROOK 18in. Shaping Machine.
KLOPP 22in. Shaping Machine.
TORPEX 22in. Shaping Machine.
New **LIMA** 22in. Shaper.

SAWING AND FILING MACHINES

WESPA AS4 Bandsawing and Bandfiling Machine, hydraulic feed (similar Do-all V/16).

WATCHMAKERS' MACHINES

MIKRON No. 79 Gear Hobber (almost new).
SAFAG Model 24 Cutter Relieving Machines.
LAMBERT Model 66 Gear Hobber.

Classified Advertisements (*PLANT FOR SALE, contd.*)

MIDLAND

BENDING ROLLS

RHODES 6ft. × 14 Gauge Power Bending Rolls.

CROPPING MACHINE

Double Ended Angle Cropping Machine. Cap. up to 6in. × ⅝in. angles.

DRILLING MACHINES

AMERICAN 6ft. H/Duty Radial Drill No. 6 M.T. Older machine, good condition. 400/3/50 sep. motor.

FOLDING MACHINE

EDWARDS 6ft. × ⅛in. High Lift Swing Beam, Universal Folder.

GRINDING MACHINES

New **N.I.** 10in., 12in., 14in., 16in. and 20in. D/E. Tool Grinders
ABRASIVE No. 34 24in. × 8in. Vertical Spindle Surface Grinder.

GUILLOTINE

RUSHWORTH 4ft. × ⅛in. O/Crank Guillotine. Little used.

KEYSEATING MACHINE

EDGWICK Keyseater. Stroke 4½in. Table 26in. × 9in.

LATHES

HERBERT No. 4 Capstan. 2½in. H/Spindle. 8speeds-511.

MILLING MACHINES

EDGWICK No. 2 Horizontal Miller. Table 46in. × 11in.
MILWAUKEE 3H. Vertical Milling Machine.

NIBBLERS

BURFREE 2A Nibbling Machine. Cap. ⅛in. M/S.
W.F. 14 Gauge Nibbler. 59in. throat.

PRESSES

TAYLOR & CHALLEN "370" 20 ton O/F. Press.
TAYLOR & CHALLEN "845" Dial Feed Notching Press. Cap. 6 tons.
TAYLOR & CHALLEN "1455" Dial Feed Notching Press. Cap. 2 tons.
BRADLEY & TURTON No. 3 Flypress.
SWEENEY & BLOCKSIDGE Bench Press. Cap. 3 tons.

SAWING MACHINE

BARSON No. 1 Saw. 1½in. rounds, 2in. tubes, 1½in. × ⅛in. flats, 1½in. × ⅛in. angles.

SCREWING MACHINE

KENDALL & GENT 3in. Screwing Machine. Leadscrew Type.

SHAPING MACHINE

TOWN 26in. H/Duty Shaper.

POLISHING MACHINES

3 and 5 h.p. Double Ended Polishing Spindles.

WELDING EQUIPMENT

PRESCOTT 15 kVA Spot Welder.

All machines 400/3/50 electrics unless otherwise stated.

THE
MIDLAND MACHINE TOOL CO.
BRADLEY, BILSTON, STAFFS.
Tel.: Bilston 42471/9.

Gordon Try Ltd

MEMBER OF THE B.A.M.T.M

LATHES

BERRY 9½in. by 48in. Gap Bed.	£875.
SIMMONDS 12in. by 66in. Gap Bed.	£450.
A.T.W. 12in. by 120in. Stl. Bed.	£525.
SOUTHBEND 6¼in. by 36in. S. Bed.	£325.
WARD 2A Bar Capstan.	£575.
WARD 7 Comb. Turret.	£250.
HERBERT 2SS Chucker.	£325.
HERBERT 4 Chucker.	£130.
HERBERT 9 Comb. Turret.	£350.
HERBERT 9 Comb. Turret. Rebuilt.	£850.
SOUTHWARK No. 2 Capstan.	£275.
NERO ¾in. Collet Capstan.	£175.
PITTLER R.B. 36 Capstan.	£250.
ACME 4 Spindle Bar Auto.	£450.
P. & G. 5D Chuck Auto.	£425.
HERBERT 3 Chuck Auto.	£250.

MILLING MACHINES

MILWAUKEE 2K Universal.	£1,250.
DENBIGH 4C Universal.	£325.
RICHMOND O.1 Universal.	£250.
ARCHDALE 28in. Production.	£350.
CINCINNATI 1-12 Production.	£550.
P. & W. Slab Mill Prod.	£155.
CINCINNATI No. 2 Vert.	£1,450.
HERBERT 15S Vert.	£525.
HERBERT 18V Vert.	£595.
ASQUITH Profile Mill.	£450.

GRINDING MACHINES

J. & S. Tool and Cutter.	£425.
WICKMAN Auto Cutter.	£275.
HUNT No. 2 Drill.	£225.
HUNT No. 4 Drill.	£235.
ARTER 12in. Ring.	£495.
B. & S. No. 13 Universal.	£575.
NEWELL 10in. by 24in. Uni.	£750.
LANDIS 10in. by 30in. Uni.	£750.
NOVAMATIC Type B Internal	£650.

DRILLING MACHINES

K. & W. 4ft. Heavy Radial.	£625.
CINCINNATI 4 Morse.	£65.
BAUGH Radial Tapper.	£150.

THE CAUSEWAY, EGHAM
SURREY
EGHAM 4166-7

Cincinnati No. 3 Dial Type
Horizontal Milling Machine complete with Universal Dividing Heads and Circular Table. Excellent condition.

Further details from:—
C. & G. OLDFIELD, LTD.
15, Abercorn Street,
PAISLEY.

New for Immediate Delivery
CENTEC Model 2B Precision Milling Machine. Power feed to Table.

Further details from:
C. & G. OLDFIELD, LTD.
15, Abercorn Street,
PAISLEY.

Oldfield & Schofield No. 1
Forcing and Straightening Press. 10 tons capacity. 15in. stroke. D/S. Mot.—WILCOX & CO., Barr Street, Birmingham 19. NORthern 1234/5.

AUTOS

CONOMATIC 1¼in. 8-spindle Type W.W.
WICKMAN 2½in. 5 spindle Auto. 1941 machine.

BORERS

UNION Model BFT 100/11. 4in. spindle.

DRILLING

ASQUITH 4ft. O.D.1 Radial Drill.
PROGRESS 5E Round Table.
ARCHDALE 28in. Heavy Duty Pillar Drill.
NEW—**MAS** Model V.R.2, 3ft., Elevating Arm Radial Drill.
MAS Model V.R.4, 4ft. 6in., Elevating Arm Radial Drill.

LATHES

SOUTHBEND 16in.
EDGWICK 7in.
DEAN, SMITH & GRACE. Height of centres 7in.
MONARCH 22M, S.S. Taper Turning Lathe.
WARD 10 Combination Turret Lathe.
WARD 7 Combination Turret Lathe.
LANG 10¼in. Gap Bed. 5ft. between.

MILLING

28in. **ARCHDALE,** Rapid all ways.
18in. **EDGWICK** Production Mill.
CINCINNATI No. 5 High Power Plain Hor. 1942 machine.
MILWAUKEE 2 HL Vertical—rebuilt.
MILWAUKEE 2K Plain—overhauled.
MILWAUKEE 3KM Universal, metric, with dividing head.
PEGARD Bed Type Vertical, table 84in. × 29in.—slightly used.
KENDALL & GENT Model C.V.M. 25.
NEW—**GIEWONT** Model F.Y.C. 25 No. 2 Vertical Miller, 44 × 10in. table. Delivery mid-October.

GRINDING

NEW—**RIBON** Model R.V.R.1000, 10 × 40in.

SHEETMETAL

GUILLOTINES
TRIUMPH 6ft. × ⅛in. Overcrank.

All machines motorised 400/3/50

STANCROFT LTD.,
BEDWORTH ROAD, COVENTRY.
Telephone Coventry 88072/3.

SOAG

30in. LANG Mod. 10A4
S.S. & S.C. LATHE

Year of manufacture 1951, Ready for work.

MAIN DATA :—

Height of centres	**15in.**
Swing over bed	**30in.**
Between centres	**10ft.**
30 Spindle Speeds	**9-820 r.p.m.**
H.P. motor	**12½**

With push button control; Roller Bearing spindle; Multi-feed gearbox; well equipped.

Full details from: **SOAG MACHINE TOOLS, LTD.,**
7, Juxon Street, Lambeth, London, S.E.11
Phone RELiance 7201. **'Grams: Sotoo'sag, London.**

it's ACORN 8881 for Machine Tools

SECOND-HAND MACHINE STOCK LIST

GRINDERS

BROWN & SHARPE No. 2 Surface Grinder.
ROBOT Surface Grinder, 6in. by 18in.
EXCEL No. 1 Surface Grinder.
FRITZ WERNER 270A Cylindrical Grinder.
LANDIS H4 Cylindrical Grinder.
BROWN & SHARPE No. 5 Cylindrical Grinder.
BROWN & SHARPE No. 13 Univeral Grinder.
CHURCHILL H.B.A. Automatic Internal Grinder.
BRYANT No. 5 Internal Grinder.

MILLERS

CINCINNATI 1-18 Production Miller.
FRITZ WERNER 10in. by 34in. Horizontal Mill.
EDGWICK Horizontal Mill, 11in. by 46in., 24-405 r.p.m.
BROWN & SHARPE No. 2 Horizontal Mill.
CINCINNATI Manufacturing Miller, 18in.
MAMMUT Horizhand Lever Mill, 10in. by 24in.
KENDALL & GENT Vert. Mill., 19in. by 69in.
TRIDENT Vertical Mill, 8in. by 30in., 75-750 r.p.m.
WANDERER Univ. Mill, 12in. by 48in., 38-480 r.p.m.

LATHES, CAPSTANS

WARD 10 Comb. Turret Lathe, 12-375 r.p.m.
WARD 8 Comb. Turret Lathe, Covered Bed, 10-800 r.p.m.
WARD 3A Ball Chuck Bar Feed.
WARD 3A Chucking Machine.
HERBERT No. 20 Turret Lathe 7in."
HERBERT No. 4 Capstan up to 750 r.p.m.
HERBERT No. 4 Capstan up to 511 r.p.m.
WARNER & SWASEY No. 2 Capstan.
SMID SRE 24 Capstan.
LANG C/Lathe 10in. by 60in.10- 500 r.p.m.
LANG 8in. by 9ft. Lathe, 9-450 r.p.m.
LANG 8½in. by 24in. Lathe, 19-900 r.p.m.
D.S.G. 8½in. by 30in. Lathe, 11-490 r.p.m.
HOLBROOK 8in. by 36in. Lathe, 11-400 r.p.m.
HOLBROOK 6½in. by 36in. Lathe, 15-400 r.p.m. Gap Bed.
COLCHESTER MASTER 6½in. by 36in. Ainjest Screwing Attachment.
SELECTA 6½in. by 36in. Lathe, 30-402 r.p.m.
ROLLO 6½in. Centre Lathe.
SWIFT Profile Copy Lathe, 18in. by 5ft. 6in.

BORERS, SLOTTERS, SHAPERS, HOBBERS, SAWS

PLESSEY Jig Borer, 12in. by 12in.
MATHEY Jig Borer.
BUTLER 14in. Slotter.
INVICTA 5M Shaper.
HOLROYD Shaper 14in. Stroke.
ESSEX No. 32 Punch Shaper.
DOWDING V.8 Gear Hobber.
KOLLE Vertical Bandsaw, 20in.

DRILLERS

POLLARD 4 Spindle Pedestal Drill.
POLLARD 3 Spindle Pedestal Drill.
POLLARD Pillar Drill, 3 M.T.
POLLARD 13 AX Pillar Drill.
POLLARD 2 AX Pillar Drill.
PROGRESS 4 E Pillar Drill.
TAUCO ½in. Bench Drill.
4 Spindle Bench Drill, 15 HEF.
BOLEY Multi-spindle Drill, VB 10.

MISCELLANEOUS

SCHIESS DEFRIES Vertical Keyseater.
STEDALL No. 2 Lapper.
EDWARDS Press Brake 4ft. by 25 ton.
RASKIN 30 Ton Double Column Draw Press.

GATE MACHINERY CO. LTD
172-178 VICTORIA ROAD · ACTON · LONDON W3
TEL. ACORN 8881/2 TELEX: 2111

Kearns No. 1 Horizontal Boring and Facing Machine, complete with Rear Stay. A.C. Motor.

Further details from:—
C. & G. OLDFIELD, LTD.
15, Abercorn Street,
PAISLEY.

Cleveland 1¼in. Type "A" Automatic, fitted top slide, gears, collets, barfeed, etc. Excellent condition, also B.S.A. ¾in. single spindle, good cond.—C. L. THOMAS, LTD., Stirling Road, Solihull. Tel. 3075-6.

Wickman 5in. Patent Chucking Auto with 5 air chucks. Late type in excellent condition.—BOX D203, MACHINERY, Clifton House, Euston Road, N.W.1.

"Quick-work Whiting" No. 48L Stamping Trimmer for sale. For trimming any type of stamping up to ¼in. mild steel. The 40in. dia. table is tilting and supports the stamping during trimming. Three cutting speeds, 15, 30, 55ft. per minute. Dia. of spindles 1¾in. Arranged motor drive 400-440/3/50.—Photograph, etc., from F. J. EDWARDS LIMITED, 359, Euston Road, London, N.W.1, or 41, Water Street, Birmingham, 3.

Brown & Ward Automatics, 1¼in. 4-ops., ¾in. 4-op., ⅝in. 4-op with threading spindle, and ½in. 3-op. All excellent condition with gears, barfeed, etc.—C. L. THOMAS, LTD., Stirling Road, Solihull 3075-6.

Oerlikon Vertical Milling Machine. Swivelling head (register 15in. dia.) Table 55in. × 13in. 18 speeds. 12 feeds. Quick traverse. Quill dia. 7½in. 1951. In really excellent condition.—BLACKFRIARS PRECISION, LTD., 154, Blackfriars Road, London, S.E.1. WAT. 3131.

Churchill HBB Internal Grinder with Sizematic Attachment.

Further details from:—
C. & G. OLDFIELD, LTD.,
15, Abercorn Street,
PAISLEY.

Beer Die Lapping and Polishing Machine. 400/3/50.—HICKS MACHINERY LTD., 26, Addison Place, London, W.11. Tel.: PARk 2333.

NEW MACHINE TOOLS FROM STOCK

EARLY DELIVERY

MITCHELL OF KEIGHLEY 8½in. Type DMS Gap Bed Lathe, by 5ft. 3in. B.C. 400/440/3/50. Instant delivery.
VICTORIA No. 2 Rapidmil Universal Milling Machine. Table size 48in. × 11¼in. 400-440/3/50. Instant delivery.
VICTORIA No. V2 Vertical Milling Machine. Table size 45in. × 11in. 400-440/3/50. Instant delivery.

CENTAUR TOOL WORKS,
EYRE STREET, SPRING HILL,
BIRMINGHAM, 18
Tel. EDGbaston 1118 & 1119. 'Grams Capstan, Birmingham

Warner & Swasey No. 1A Combination Turret Lathe, Serial No. 434780.

Further details from —
C & G. OLDFIELD, LTD.,
15, Abercorn Street,
PAISLEY.
Member of B.A.M.T.M.

American First Class Machines of all types can be supplied from our American Showrooms. Send your enquiries to K & C MACHINERY, LTD., Stephen Street, Coventry. Telephone: Coventry 23669.

Reed Prentice No. 5 Vertical Milling Machine. Table 68in. × 16in. 18 Spindle Speeds 17-600 r.p.m. Excellent condition. Further details from —

C. & G. OLDFIELD, LTD.
15, Abercorn Street,
PAISLEY.

U.2 "Victoria" Rapidmill. (New). Delivery: Ex. Stock. J. P. Summers (Southampton) Ltd., Maybush Road, Wimpson Lane, Southampton.

SOAG VERTICAL MILLING MACHINES

KNEELESS TYPE

FOR IMMEDIATE DELIVERY—ATTRACTIVE PRICES

CVM25 KENDALL & GENT Vertical Milling Machine, separate motor drive for spindle, rise and fall of spindle head and table feeds. Table working surface 66in. × 19in.; capacity 54in. × 21in. × 26in.; 18 spindle speeds from 15 to 840 r.p.m.; Main motor drive 10.

28V ALFRED HERBERT Vertical Miller, drive from foot-mounted motor at rear of column; table working surface 85in. × 28in.; capacity 62in. × 29in.; maximum distance table to spindle 32in.; 16 spindle speeds from 12 to 360 r.p.m.; H.P. motor 20.

Full details from: **SOAG MACHINE TOOLS LTD.,**
7, Juxon Street, Lambeth, London, S.E.11
Phone: RELiance 7201. 'Grams: Sotoolsag, London

Classified Advertisements (*PLANT FOR SALE, contd.*)

RING BELLS *for machine tools*
LEEDS 63-7398

H.M.E. L 70 Geared Open Front Power Press—70 tons pressure, adjustable stroke ⅜in. to 4½in., Bed area 32in. × 27in., Throat 10½in., 400/3/50, complete with die cushion and air receiver.
LANG 7in. Centre Lathe, 30in. between centres, 12 spindle speeds, 37 to 908 r.p.m., hole through spindle 1⅛in. dia. full screw-cutting, 400/3/50, fitted toper turning.
PRECIMAX Cylindrical Plain Grinder. Capacity 8in. × 24in. Plunge feed. Coolant tank and fittings. 400/3/50.
RASKIN Type 6A 100 ton Geared, Eccentric Power Press. Adjustable stroke ⅛in. to 3⅛in. Bed area 29½in. × 23½in. 400/3/50.
C.V.A. MILWAUKEE 2E Horizontal Plain Milling Machine. Table size 52in. × 12in. Power and Rapid power to table. 8 spindle speeds 25 to 1,000 r.p.m. 400/3/50.
FROST Power Swing Beam Folding Machine, 4ft. × ¼ capacity, 400/3/50.
TAYLOR ½in. Capstan Lathe, fitted collet chuck and barfeed. 12 spindle speeds 210-2,750 r.p.m. forward and reverse, hand lever feed. 400/3/50. 1960 M/C.
VAN NORMAN No. 12 Sliding Head Milling Machine. Table size 38in. × 8in. 9 spindle speeds 70 to 1,465 r.p.m. 12 auto feeds ⅛in. to 14in. per minute. 400/3/50. Complete with Vertical Attachment.
BROOKES Overcrank Double Geared Power Guillotine, capacity 4ft. × ⅛in. Powered work table (in two sections) 24ft. long approx. × 4ft. wide. 20 h.p. 400/3/50.
WILLSON Mark 6½in. Lathe, 24in. between centres. 9 spindle speeds. 52.9 × 5 r.p.m., full range of screw cutting. 400/3/50.

STANCROFT LTD.,
LANCASTER STREET, BIRMINGHAM, 4
ASTon Cross 2235

FORREST

RHODES 6ft. 0in. × ¼in. Guillotine.
BENNIE 4ft. 0in. × ⅛in. Bending Rolls.
LANG 22in. Boring and Facing Lathe.
ORMEROD 36in. Shaper.
REDMAN 10ft. × 4ft. × 3ft. Planer, Lancs. drive.
RICHARDS No. 1 and 2 Horiz. Borers.
DENHAM 11in. × 6ft. 6in. S.S. & S.C. Lathe.

W. FORREST & CO. LTD.,
SYLVESTER GARDENS,
SHEFFIELD, 1.
'Phone: 23314/5.

Goss & deLeeuw 6 × 6¼ Tool Rotating 4-Spindle Automatic Chucking Machine. 400/3/50. Threading attachment.—HICKS MACHINERY, LTD., 26, Addison Place, London, W.11. Tel.: PARk 2333.

Jones & Shipman 18in. × 6in. hydraulic traverse surface grinder, Fig. 540, inbuilt electrics, 400/3/50, magnetic chuck, 14in. × 6in., also Abwood 14in. × 7in. vertical spindle surface grinder, hand feeds, Good cond.—C. L. THOMAS, LTD., Stirling Road, Solihull. Tel. 3075-6.

Mitchell 8¼in. S.S. & S.C. Gap Bed A.G.H. Lathe with 3in. Hollow Spindle. Speed range 30-400 r.p.m. Further details from:
C. & G. OLDFIELD, LTD.
15, Abercorn Street,
PAISLEY.
Member of B.A.M.T.M.

Cincinnati No. 3 Vertical Mill. British manufacture. Dial type. 16 spindle speeds. 18-450 r.p.m. 16 feeds. Power feeds and quick traverse to all feeds. Hydraulic speed and feed selections. Dual controls. Table 62½in. × 15in. Coarse and fine hand feed to head. Excellent condition.—BLACKFRIARS PRECISION, LTD., 154, Blackfriars Road, London, S.E.1. WAT. 3131.

Corona Heavy Duty Vertical Drilling Machine. No. 5 Morse Taper. Excellent condition.
Further details from:—
C. & G. OLDFIELD, LTD.,
15, Abercorn Street,
PAISLEY.

Cincinnati 1-18 Auto Production Miller.—A. McNAMARA & CO., LTD., New Line, Bacup, Lancs. 'Phone: Bacup 946.

Norton Hor. Spindle Surface Grinder, 60in. × 12in. cap., electric chuck, 400/3/50, £700.—A. McNAMARA & CO., LTD., New Line, Bacup, Lancs. 'Phone: Bacup 946.

Bradley & Turton 4-Column Hydraulic Press for sale. Upstroke. Pressure 50 tons. Stroke 10in. Adjustment to head 12in. Max. daylight bed to head, stroke down head in highest position 24in. Bed available 15⅛in. × 15⅛in. Gas heated platens. "Udal" safety guard.—F. J. EDWARDS LIMITED, 359, Euston Road, London, N.W.1, or 41, Water Street, Birmingham, 3.

Asquith 7ft. Heavy Duty Port- able Radial Drill. As new.—BOX D195, MACHINERY, Clifton House, Euston Road, N.W.1.

UNIQUE OFFER
LANDIS Type DD 25in. × 80in.
Hydraulic Crank-pin Grinder, built 1947, virtually unused. Weight approx 15 tons.
Price £5,500.
STAINES MACHINE TOOL CO. LTD.,
THE CAUSEWAY, STAINES
Telephone: Staines 52647

SITUATIONS VACANT

If you do not wish your reply to any Box No. advertisement in this section to be forwarded to certain firms, please advise us. Your reply will then be destroyed, but you will not be notified as this would disclose the identity of the advertiser.

Sales Engineer Required With initiative and experience for the sale of U.S.A. and Continental Machine Tools and Equipment. Based on London, would have to travel throughout U.K., driving licence essential. Salary, commission, expenses and car or car allowance. State experience and salary required. —BOX D201, MACHINERY, Clifton House, Euston Road, N.W.1.

Production Manager Required for foundry in N.W. London, the essential requirements being age limit 30-40, an engineering background and ability to plan production, some knowledge of time and motion study an advantage. This appointment provides scope foreman with energy, drive and initiative. When replying please give brief details of education, experience and salary required. Our own staff have been informed of this advertisement.—BOX D208, MACHINERY, Clifton House, Euston Road, N.W.1.

LANCHESTER COLLEGE OF TECHNOLOGY, COVENTRY.
(Principal: A. J. RICHMOND, B.Sc. (Eng.), Ph.D., M.I.Mech.E.)

Applications Invited for Follow- ing posts, duties to commence as soon as possible.

SENIOR LECTURER IN AIRCRAFT STRUCTURES
Candidates should normally be University graduates and membership of the Royal Aeronautical Society would be an advantage. Appropriate industrial experience is essential while teaching and/or research experience would be of value.
Salary—£1,550 by £50 to £1,750 p.a. (now under review). In certain circumstances, persons appointed may be paid commencing salary above minimum of scale.

LECTURER IN PRODUCTION ENGINEERING
Candidates should be corporate members of the Institution of Mechanical Engineers, or the Institution of Production Engineers, or if possible of both Institutions. Substantial industrial experience is essential, while some teaching experience would be an advantage. The successful candidate will be expected to teach one or more of the following to an advanced standard—Metrology and Inspection, Machine Tool Design and Application, Production Tooling, Production Processes.
Salary—£1,370 by £35 (4) by £40 (1) to £1,550 p.a. (now under review). In certain circumstances, persons appointed may be paid commencing salary above minimum of scale.
The College is largely housed in new buildings occupied in 1960. The Department of Production Engineering is wholly situated in new buildings while the new laboratories for the Department of Aeronautical Engineering will be available in 1963. Equipment and general facilities in the buildings are excellent and all members of staff are encouraged to pursue research. Five Dip. Tech. courses have been approved including courses in Aeronautical Engineering and Production Engineering and will commence in September, 1961.
Further particulars and application forms from the Registrar, Lanchester College of Technology, Priory Street, Coventry, to whom applications should be submitted by 29th September.
W. L. CHINN,
Director of Education.

Free Lance Designer Required by South London firm for scissors-type Platform Lifts, 5/10-ton capacity.—Brief details in first instance to BOX D193, MACHINERY, Clifton House, Euston Road, N.W.1.

Chief Inspector and Senior In- spector required by company manufacturing aluminium extrusions and pressings. Experience of enamels and inks for decorated work would be an advantage.—Apply H. G. SANDERS & SONS, LTD., Gordon Road, Southall, Middlesex.

Foreman, Plastic Mould Tool- room. Good salary and opportunities.—Write stating experience, etc., to BOX D202, MACHINERY, Clifton House, Euston Road, N.W.1.

Manager. Expanding Engineer- ing company has vacancy for keen ambitious man. Fully experienced machining and fabricating to A.I.D. Essential knowledge of costing. Redhill, Surrey area.—BOX D205, MACHINERY, Clifton House, Euston Road, N.W.1.

Auto-Demonstrator (Single Spindle Turret) required by Sales Organisation of leading manufacturers. Experience to include setting of capstans, bar and chucking autos. Applicants should reside in London area, up to age 35, must be willing to travel in U.K. Only first-class engineers considered. Intelligence, ability to instruct unskilled personnel, good personality essential. Full particulars, education, experience, to BOX D187, MACHINERY, Clifton House, Euston Road, N.W.1.

A TIME STUDY ENGINEER

Leading Rubber Manufacturers who have expanded their Toolroom/Machine Shop tenfold in the last five years and expect to increase at same rate require

A TIME STUDY ENGINEER

Able to Rate single and Batch items at planning stage.

This is a new position which for an energetic man, will lead to a Progressive future.

Apply:

The Cannon Rubber Manfrs. Ltd.
Ashley Road
Tottenham, N.17

Highly Paid, Secure and Interesting posts are always available for technically trained men. Find out how you can put some letters after your name by preparing at home on "No Pass—No Fee" terms. A.M.I.Mech.E., A.M.I.Prod.E., A.M.S.E., City and Guilds, etc. Full details of exams. and hundreds of courses in all branches of Engineering. Draughtsmanship, Management and Automation Techniques, the benefits of our Employment Dept. and unique record of 95 per cent. successes are given in "Engineering Opportunities"—a valuable 148-page Guide which will reveal many chances you are now missing.—Write for your copy today (stating subject of interest).—FREE and without obligation. B.I.E.T. (Dept. 43a), 29, Wright's Lane, London, W.8.

INLAND REVENUE VALUATION OFFICER:

VALUERS

Pensionable posts in offices in England and Wales and in Scotland for qualified men and women at least 24 and under 34 on 1st October, 1961; extension for candidates with regular Forces service or Overseas Civil Service. Vacancies are in District (Revenue and Compensation) and Area (Rating) offices and include posts for valuation of minerals, plant and machinery, and licensed property. Vacancies in Scotland are in District (Revenue and Compensation) offices only. Qualifications: Final examination of R.I.C.S., C.A. and E.A.I., or C.L.A.S., or B.A.(Cantab.) or B.Sc. (Lond.) in Estate Management. At least four years' professional (or mining, for valuation of minerals posts) experience. For Scottish posts experience in Scotland desirable, and qualifying examination preferably based on Scottish syllabus. For valuation of mineral posts, First Class Certificate of Competency (Mine Managers) acceptable as professional qualification. Starting salary from £858 (24) to £1,258 (34 or over); scale maximum £1,430. Promotion prospects. Write Civil Service Commission, Burlington Gardens, London, W.1, for application form, quoting 149/61/36. Closing date 17th October, 1961.

MACHINE TOOL ENGINEER

FOR DEMONSTRATION AND SERVICING OF GEAR HOBBING MACHINES. Must have good practical experience together with technical knowledge of machine tools and gear production and be prepared to travel throughout the U.K. after initial training at American Works. Excellent prospects.

Please give full details of education, experience, qualifications and salary, to Sales Director, DORMAN MACHINERY SALES LTD., Woodside Hill, Chalfont St. Peter, Bucks.

Machine Tools Publicity

Britain's machine tool industry offers unsurpassed opportunities for a stable and rewarding career. We are one of the largest and most progressive companies in the industry and are looking for men of undoubted professional skill to help us implement plans for future expansion. We need now:

1. A House Journal Editor

This post requires a man with fluent writing ability and wide journalistic experience, probably in his early forties, capable of organising a domestic news service within and for a widely scattered organisation, and the production of features pertinent to the promotion of good industrial relations. He should be familiar with the sources of free-lance authors' services and know when to use them; have some knowledge of the mechanics of make-up and print production; and drive a car. He must be prepared to travel widely in the U.K. and possibly overseas.

Ref. HJE

2. A Print Designer and Production man

Probable age limits 28/35 years; having several years experience on high quality design and production through all stages, letterpress and offset. Previous experience in engineering particularly desirable; City and Guilds or other qualifications an advantage. Ref. PDP

3. A Direct Mail Specialist

We think we may not find a man with all the qualifications we require. We would like him to be under 35 years old; fully conversant with the psychology of sales letter composition; with an engineering background; and familiar with the latest mechanical addressing and list compilation and cleaning methods. His most important skill will be the facile production of direct mail ideas for a wide range of products. Ref. DM

Applications should reach us by September 30th and should state in detail particulars of education and experience to date, age and marital state. We have no fixed ideas on salaries but pay generously, commensurate with qualifications. Midlands location.

Box D206, MACHINERY,
Clifton House, Euston Road, N.W.1

The Methods Advisory Service of Remington Rand Ltd. have been instructed by one of their clients, a progressive Midland engineering company, in pleasant country area and employing a works staff of 800, to advise on the following appointments.

These appointments provide a unique opportunity for those seeking a sound position for the future.

QUALITY CONTROLLER

This top level executive post carries the responsibility of setting up and controlling an inspection organisation within the Foundry, Machine, Fabrication, Wood-working and Fitting Shops, utilising the latest control methods and techniques.

The post provides an excellent opportunity for a fully-qualified and ambitious quality control engineer experienced in staff control, aged 30-40. Ref. No. 0020/1.

PLANNING ENGINEER

The responsibility of this post, within an expanding Planning department, is to plan the work-load initially on the Foundry and ultimately on all production departments. The post provides an excellent opportunity for a planning engineer who has had sound practical workshop, progress and planning experience, aged 25-30. Ref. No. 0020/2.

Salaries will be determined according to qualifications and experience. Applications stating qualifications should be made in writing, in the first instance, to:—

THE MANAGER
METHODS ADVISORY SERVICES
REMINGTON RAND LIMITED
65 HOLBORN VIADUCT, LONDON, E.C.1

marking the envelope "Confidential", quoting the relative reference number. Candidates identity will not be disclosed, unless permission is given after interview.

SALES REPRESENTATIVES

Production Tools and Machine Shop Equipment

Midlands—North of England

TWO GOOD MEN!

required by

North West Manufacturer at present selling mainly through Merchants. Now building up a nation-wide direct sales force to cope with expanding range of products.

EACH MAN must have ability to earn a minimum of between £30 and £40 per week *immediately*.

PROMOTION is open to each via Area Sales Manager—Sales Manager, upon proved ability.

DO NOT WRITE TO US unless all the following qualifications are held:—

AMBITION ENTHUSIASM ENERGY
ENGINEERING BACKGROUND
THE GOODWILL OF EXISTING CONTACTS
SINCERITY OF THOUGHT AND ACTION
A SUCCESSFUL RECORD OF PAST SALES
CLEAN DRIVING LICENCE
AGE BELOW 45

Please write fully, in strictest confidence, to THE MANAGING DIRECTOR, c/o

Box D197
MACHINERY, Clifton House, Euston Road, N.W.1

(No approach to any firms or persons mentioned in your letter will be made without your permission)

THIS IS A FIRST CLASS OPPORTUNITY

SITUATIONS WANTED

Chief Inspector, A.I.D., A.R.B. Approved. 18 years experience production tools, planning, estimating. General machine shop technique. Also rubber manufacture and hose assemblies M.O.S.—BOX D161, MACHINERY Clifton House, Euston Road, N.W.1.

Practical Engineer, Age 45, Life experience all branches production control, tool, etc., seeks position as Works Manager with a progressive company preferably, Southern area.—BOX D209, MACHINERY, Clifton House, Euston Road, N.W.1.

Machine Shop Foreman Required for small Engineering Co., S.W. London. Complete charge of estimating and production. Profit sharing. State experience and salary required.—BOX D194, MACHINERY, Clifton House, Euston Road, N.W.1.

Foreman Required for Small Machine Shop, North London.—Apply BOX D109, MACHINERY, Clifton House, Euston Road, N.W.1.

REPRESENTATIVE

MACHINERY Requires an Editorial Representative residing in Manchester, Sheffield or Halifax areas. Must possess a thorough knowledge of machine tools and engineering processes, also the ability to write clearly and fluently. Good salary, car provided, expenses paid, Bonus and Pension Schemes.—Write EDITOR, MACHINERY, Clifton House, 83-117, Euston Road, London, N.W.1.

Company manufacturing an increasing range of Specialised Machine Tool Equipment require

FREE LANCE SALES REPRESENTATIVES

for the following areas:—
1. Lancashire, Yorkshire.
2. Cheshire, Derbyshire, Notts., Lincolnshire, Staffs.
3. Scotland.
4. South and Mid-Wales, Gloucestershire, Hereford.
5. Westmorland, Durham, Cumberland, Northumberland.
6. Northern Ireland and Eire.
7. Suffolk, Norfolk, Cambridgeshire, Bedfordshire.

Applicants must have established contacts, be fully conversant with Engineering principles, and be prepared to devote a reasonable share of their time to the firm's products. A weekly commission in EXCESS of £15 per week (much more is possible) will be expected to be paid. Ambitious and conscientious persons would be well advised to write to the Sales Director

Box D198
MACHINERY, Clifton House Euston Road, N.W.1

RECEIVED TOO LATE FOR CLASSIFICATION

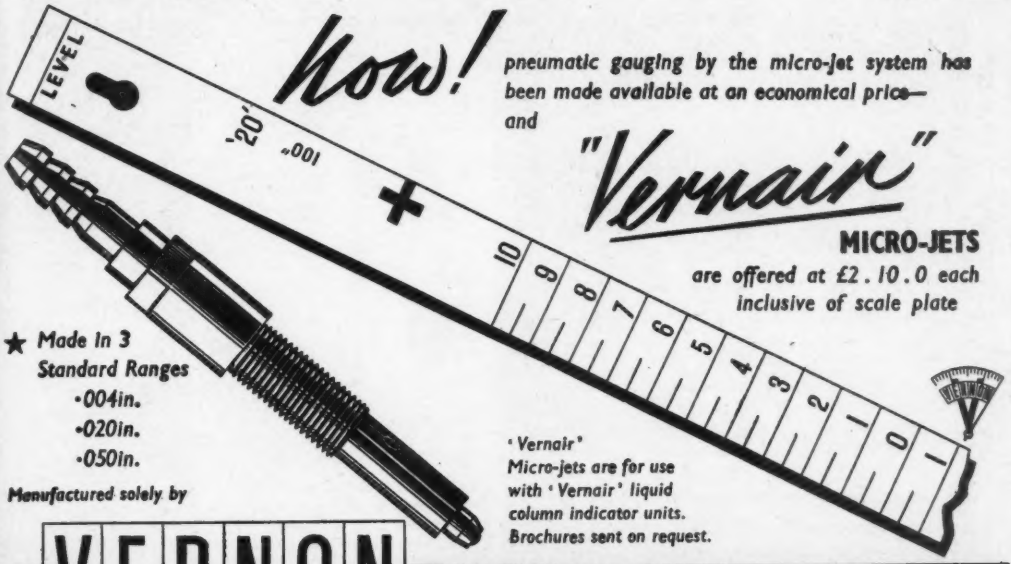
PLANT WANTED

WANTED URGENTLY
TWO HERBERT No. 4 SENIOR CAPSTAN LATHES

STATE AGE, SERIAL No., CONDITION AND PRICE

BOX D199, MACHINERY, Clifton House, Euston Road, N.W.1

Thread Grinder Wanted.—BOX D204, MACHINERY, Clifton House, Euston Road, N.W.1.



How! *pneumatic gauging by the micro-jet system has been made available at an economical price— and*

"Vernair"

MICRO-JETS

are offered at £2.10.0 each inclusive of scale plate

★ *Made in 3 Standard Ranges*
·004in.
·020in.
·050in.

Manufactured solely by

'Vernair' Micro-jets are for use with 'Vernair' liquid column indicator units. Brochures sent on request.

VERNON INSTRUMENT COMPANY LTD.
WILBURY WAY HITCHIN HERTS. *Phone: Hitchin 2322/4*

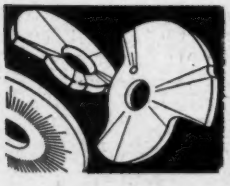
INDEX TO ADVERTISERS

	PAGE
Abbey Heat Treatments Ltd.	187
A.B.M.T.M. Ltd.	55 & 56
Abwood Machine Tools Ltd.	2
Acbars Ltd.	145 & 199
Adams, Cyril & Co. Ltd.	95
Adcock & Shipley Ltd.	131
Aircraft Unit Eng'g. Co.	190
Ajax Machine Tool Co. Ltd.	143
Alfa-Laval Co. Ltd.	121
Allspeeds Ltd.	74
Ambressey Engineering Co. Ltd.	188
A.M.T. (Birmingham) Ltd.	171
Anderton Springs Ltd.	178
Armytage (Tools) Ltd.	202A
Austin, E. & Sons (London) Ltd.	184
Aylesbury Turned Parts (True Screws) Ltd.	190
Balfour, Arthur & Co. Ltd.	21
Beakbane, Henry (Fortox) Ltd.	160
Bell, H. (Machine Tools) Ltd.	198, 208 & 216
Benton Engineering Co. Ltd., The	188
Beryllium & Cooper Alloys Ltd.	126
B.G. Machinery Ltd.	136
Bishop Eaves & Sons Ltd.	15
Boardman, R. G. (Tools) Ltd.	168
Bowers Internal Gauge Co. Ltd.	158
Brayshaw Tools Ltd.	*Inside Front Cover*
Brierley, Z., Ltd.	193
Brilhart Ltd.	194
British Indicators Ltd.	116
British Oxygen Co. Ltd.	26 & 27
Britool	176
Broadbent, Henry Ltd.	66 & 67
Brookhirst Igranic Ltd.	113
Brown, David Corporation (Sales) Ltd., The	103
Brown & Sharpe Ltd.	10 & 11
Brown & Ward (Tools) Ltd.	51
Bryce Ltd.	189
B.S.A. Tools Ltd.	*Back Cover*
Buck & Hickman Ltd.	91
Buck & Ryan Ltd.	174
Buhler Bros. (England) Ltd.	159
Burton, Griffiths & Co. Ltd.	*Back Cover*
Butcher, Henry & Co.	197
Butler Machine Tool Co. Ltd., The	56
Carne, Rudolph & Co. Ltd.	40
Carobronze Ltd.	184
Carron Co.	50
Carter, B. & F. & Co. Ltd.	194
Cashmore, John Ltd.	202
Centaur Tool Works	200, 203 & 215
Centec Machine Tools Ltd.	89
Churchill, Chas. & Co. Ltd.	7
Cinetra Manufacturing Co. Ltd.	186
Clarkson (Engineers) Ltd.	5
Cohen, Geo. Sons & Co. Ltd.	35 & 211
Copas, V. J. Ltd.	188
Coventry Grinders Ltd.	193
C.P.E. Ltd.	188
Crawford Collets Ltd.	22
Crompton Parkinson Ltd.	94
Cross Co., The	108 & 109
Cross Manufacturing Co. (1938) Ltd.	176
Crowthorn Engineering Co. Ltd.	20
Croydon Tool & Case Hardening Specialists Ltd.	187
Cuncliffe & Croom Ltd	149
Dean & Mulhall Ltd.	168
De Bergue Machine Tools Ltd.	180
Denison Deri Ltd.	46
Designex (Coventry) Ltd.	19
Desilux Ltd.	182
Dimco (Gt. Britain) Ltd.	208
Dinsdale Engineering Co. Ltd.	192
Dorman Long (Steel) Ltd.	148
Dorman Machinery Sales Ltd.	69
Douglas, A. Co. Ltd.	212
Dowding & Doll Ltd.	28, 29, 138 & 144
Dowling, David Ltd.	156 & 164
Drummond-Asquith Ltd.	92 & 93
Duplex Electric Tools Ltd.	152
Eclipse Foundry & Engineering Co. (Dudley) Ltd.	188
Economic Stampings Ltd.	191
Edmonton Tool & Eng'g. Co. Ltd.	193
Edwards, Albert (Machinery) Ltd.	197, 199, 200 & 212
Edwards, F. J. Ltd.	48, 195, 198, 200 & 202
Eeseset Gauges Ltd.	182
Elgar Machine Tool Co. Ltd.	31, 147, 162 & 203
Elliott, B. (Machinery) Ltd.	53 & 201
Ellison Spring Clips Ltd.	194
E.M.C. Eng'g. Co. (London) Ltd.	194
Embassy Machine & Tool Co. Ltd.	32 & 33
English Numbering Machines Ltd.	155
English Steel Tool Corp. Ltd.	17
Fase Manufacturing Co. Ltd., The	138
Firth Brown Tools Ltd.	98 & 99
Fletcher Miller Ltd.	126
Follsain Wycliffe Foundries Ltd.	133
Forrest, W. & Co. Ltd.	216
Frye Machine Tool Co. Ltd.	142 & 199
G.A. Precision Products Ltd.	191
Gale, A. E. Ltd.	193
Gate Machinery Co. Ltd.	196 & 215
Gauges & Instruments Ltd.	191
Goulder, J. & Sons Ltd.	18
Granby, Paul & Co. Ltd.	110 & 111
Graviner Mfg. Co. Ltd.	189
Gray, R. O.	205
Gribben-Davies (Machine Tools) Ltd.	210
G.R.M. Heat Treatments Ltd.	188
Guyson Industrial Equipment Ltd.	154

(Continued on page 220)

INDEX TO ADVERTISERS—*(continued from page 219)*

	PAGE
Haesler Sales	178
Hargreave, J. M. & Co. Ltd.	188
Harrison, R. C. & Sons (Brassfounders) Ltd.	162
Harrison, T. S. & Sons Ltd.	12
Hatch, Geo. Ltd.	140
Hayes Engineers (Leeds) Ltd.	14
Headland Eng'g. Developments Ltd.	180
Hedges Reinforced Plastics Ltd.	184
Heliot	202
Hepworth Iron Co. (Eng.) Ltd., The	13
Herbert, Alfred Ltd.	45, 47, 105 & 208
Herbert, Edward G. Ltd.	141
Hey Engineering Co. Ltd.	154
High Precision Equipment Ltd.	157
High Speed Service Tool Co. Ltd.	191
Higher Speed Metals Ltd.	34
Hindle Auto Products Ltd.	*Inside Front Cover*
Hockley Chemical Co. Ltd.	124
Holbrook Machine Tool Co. Ltd.	107
Holland & Caesar Ltd.	188
Holt Bros. (Halifax) Ltd.	187
Hornamill Machine Tool Co. Ltd., The	178
Hunt, Herbert & Sons Ltd.	181
Huntley & Sparks Ltd.	189
Hurlock, Wm. Jnr. Ltd.	195
Ideal Hardening Co. Ltd.	188
Ilich, F. M. (Gears) Ltd.	186
Ilifex Metals Ltd.	189
Indusmond (Diamond Tools) Ltd.	139
Industrial Diamond Information Bureau	175
J.B. Machine Tool Co. Ltd	196
Jones, A. A. & Shipman Ltd.	122
Jones, E. H. (Machine Tools) Ltd.	197 & 200
Kavanagh O'Moore & Co. Ltd.	146
Kayser, Ellison & Co. Ltd.	80
K. & C. Machinery Ltd.	199
Kearns, H. W. & Co. Ltd.	100
Keeton, Sons & Co. Ltd.	82
Keir, Alan Ltd.	185
Kelly R. & Sons Ltd.	198 & 200
Kenilworth Mnfg. Co. Ltd., The	160
K.E.N.T. Machinery & Engineering Co.	197 & 204
Kerry's (Engineering) Co. Ltd.	61 & 68
Kierserling, Th. & Albrecht	23
Kingsland Engineering Co. Ltd.	203
Kirk, Harry Eng'g. Ltd.	212
Kneller (Instruments & Tools) Ltd.	137
Lafarge Aluminous Cement Co. Ltd.	54
Lanarkshire Bolt Ltd.	150
Landen (Engineers) Ltd.	185
Landis Machine-Maiden Ltd.	117
Lattimer, E. R. Ltd.	190
Lawrence, A. & Co. (Machine Tools) Ltd.	195 & 203
Layton, M. C. Ltd.	196
Lenchs (Birmingham) Ltd.	192
Lewis, Frank & Co. (London) Ltd.	150
Liberty Eng'g. Supplies Ltd.	202
Lines, J. H. Ltd.	184
Lloyd, Richard Ltd.	120
Lumsden Machine Co. Ltd.	132
MacDowall Equipment Co. Ltd.	192
Machinery Publishing Co. Ltd., The	177 & 202B
Machine Shop Equipment Ltd.	81, 174 & 183
Macready's Metal Co. Ltd.	86
Marbaix, Gaston E. Ltd.	78, 119 & 153
Marley, W. H. & Co. Ltd.	172
Marsden & Shiers Ltd.	189
Marsden, W. G. Engineering Ltd.	189
Martin Bros. (Machinery) Ltd.	201
Mathieson, Olin Ltd.	134
Maun Industries Ltd.	182
Meadows, Henry Ltd.	186
Meddings, W. J. Ltd.	25
Mercantile Credit Co. Ltd.	167
Mercer, Thomas (Air Gauges) Ltd.	83
Metalexport	6
Metal Stitching Co., The	169
Middleton Tool & Engineering Co. Ltd.	192
Midland Machine Tool Co., The	214
Millen, Edwin & Sons Ltd.	196 & 201
Mills, George (Engineers) Ltd.	187
Mills, John & Co. (Llandidloes) Ltd.	60
Mobile Haulage Ltd.	184
Modern Machine Tools Ltd.	196
Moore Manufacturing Co. Ltd., The	106
Mortimer Engineering Co. Ltd.	180 & 184
Mortimer Machine Tool Co. Ltd.	38 & 129
Moser Cams & Tools Ltd.	220
M.P.J. Gauge & Tool Co. Ltd.	170
Murray's (Pretoria) Eng'g. Co. Ltd.	180
Nalsh Bros. & Co. Ltd.	192
Neill, James & Co. (Sheffield) Ltd.	165
Newall Group Sales Ltd.	85
Newall Used Machine Division	199
Newman Industries Ltd.	102, 196 & 204
Newton Sales Co. Ltd.	156
Nickols Automatics Ltd.	142
Nitram Metal Treatment & Eng'g. Co. Ltd.	187
Noble & Lund Ltd.	84
Norton, W. E. (Machine Tools) Ltd.	206 & 207
O.K. Trading (B'ham Factors) Ltd.	194
Oldfield & Schofield Co. Ltd.	62 & 63
Optical-Mechanical (Instruments) Ltd.	172
Ormond Eng'g. Co. Ltd., The	57
Park Gate Iron & Steel Co. Ltd., The	30
Parnum Gauges Ltd.	104
Payne Products International Ltd.	71
Pearson Panke Ltd.	125
Pidgen Bros. Ltd.	210
Pinder, W. & Son Ltd.	140
Pollard, Fredk. & Co. Ltd.	151
Poole, Martin Ltd.	201
Potts, Norman E. (Machinery) Ltd.	200
Powell, C. B. Ltd.	185
Power Petroleum Co. Ltd., The	101
Pratt, F. & Co. Ltd.	88
Pratt Levick & Co. Ltd.	4
Precision Gear Machines & Tools Ltd.	24
Precision Grinding Ltd.	144
Precision Heating Ltd.	187
Precision Products (Romford) Ltd.	185
Press & Shear Machinery Ltd.	179
Presswork Products Ltd.	192
Production Tool Alloy Co. Ltd.	179
Qualters & Smith Bros. Ltd.	64 & 65
Raistrick, J. E. Ltd.	195 & 196
Ratcliffe Tool Co. Ltd.	160
Redcar Eng'g. Co. Ltd.	190
Redman Tools & Products Ltd.	112
Remington Rand Ltd.	218
Research Engineers Ltd.	191
Richards, George & Co. Ltd.	79
Rockwell Machine Tool Co. Ltd.	41, 42, 43, 44, & 170
Rocol Ltd.	128
Rodgers Bros. Ltd.	187
Rolls Tools Ltd.	209
Roth, L.	201
Ryder, Thomas & Son Ltd.	3
Rye, Claude Bearings	193 & 195
Sale, H. B. & Co. Ltd.	*Inside Back Cover*
Sanderson Bros. & Newbould Ltd.	130
Saunderson & Costin Ltd.	70
Selson Machine Tool Co. Ltd., The	36 & 37
Senior, Tom (Liversedge) Ltd.	166
Seton Creaghe Engineering Ltd.	186, 187 & 190
Shand, J. H. Ltd.	170
Shardlow Micrometers Ltd.	168
Sheffield Twist Drill & Steel Co. Ltd., The	16
Shelmerdine & Mulley Ltd.	190
Slack, Sellars & Co. Ltd.	148
Sleeper, C. E. Ltd.	158
Slingsby, Walter & Co. Ltd.	194
Smith & Grace Ltd.	172
Smith & Netherwood Ltd.	190
Soag Machine Tools Ltd.	164, 210, 214 & 215
Southern Engineering & Machinery Co. Ltd.	197
Southern Forge Limited	135
Southwell, W. R. (Designs) Ltd.	185
Spectra Chemicals Ltd.	163
Speed Tools Ltd.	152
Staines Machine Tool Co. Ltd.	216
Stancroft Ltd.	196, 208, 214 & 216
Stanley Machine Tool Co. Ltd., The	127
Stephens, R. & Son Ltd.	193
Stirk, John & Sons Ltd.	97
Straight & Vines Ltd.	200
Stuart-Turner, S. M. & Co. (Surrey) Ltd.	191
Sturtevant Engineering Co. Ltd.	123
Suffolk Ironfoundry (1920) Ltd.	146
Sykes Machine Tool Co. Ltd.	49
Sykes, W. E. Ltd.	39
T.A.L. Developments Ltd.	166
Talbot Tool Co. Ltd.	*Inside Back Cover*
Tate Machine Tool Co. Ltd.	213
Taylor Industrial Clutches	182
Tecalemit Ltd.	52
Thompson, Michael S. Ltd.	58
Times Machinery Co. Ltd.	90, 158 & 173
Tornos Sales Co.	59
Trumeter Co. Ltd., The	178
Try Gordon Ltd.	214
Turner Bros. Asbestos Co. Ltd.	181
Turner, G. H. & Co. Ltd.	186
Universal Ball Bearing Co.	194
Valley Products (Lye) Ltd.	174
Vaughan Associates Ltd.	161
Veedor-Root Ltd.	183
Veraloy Products Ltd.	96
Vernon Instruments Co. Ltd.	219
Victa Engineering Co.	166
Visual Planning Systems Ltd.	176
Vulcascot (G.B.) Ltd.	164
Ward, H. W. & Co. Ltd.	55
Ward, M. (Machine Tools) Ltd.	196
Webster & Bennett Ltd.	72
Welsh Metal Industries Ltd.	118
Welwyn Tool Co. Ltd.	162
Westool Ltd.	114 & 115
Wickman Ltd.	1
Widdowson, Herbert & Sons Ltd.	73, 75, 76, 77, 198 & 204
Wilkins & Mitchell Ltd.	*Front Cover*, 8 & 9
Windley Bros. Ltd.	180
Wire Bands Ltd.	194
Wright Electric Motors (Halifax) Ltd.	87
Yorkshire Precision Gauges Ltd.	112
Zephyr Cams Ltd.	189



CAMS, FORM TOOLS, CAM BLANKS

We design and manufacture complete tooling for all turret type and swiss-type automatic screw machines. Cam blanks supplied ex-stock. Cams machined to customers drawings

MOSER CAMS & TOOLS LTD., 465 HORNSEY ROAD, LONDON, N.19

TELEPHONE ARCHWAY 1766 and 7017

PAGE

ack Cover 130
.... 70
36 & 37
.... 166
87 & 190
.... 170
.... 168
he.. 16
.... 190
.... 148
.... 158
.... 194
.... 172
.... 190
14 & 215
Ltd. 197
.... 135
.... 185
.... 163
.... 152
.... 216
14 & 216
.... 127
.... 193
.... 97
.... 200
d.. 191
.... 123
.... 146
.... 49
.... 39

.... 166
ack Cover
.... 213
.... 182
.... 52
.... 58
58 & 173
.... 59
.... 178
.... 214
.... 181
.... 186

.... 194

.... 174
.... 161
.... 183
.... 96
.... 219
.... 166
.... 176
.... 164

.... 55
.... 196
.... 72
.... 118
.... 162
14 & 115
.... 1

98 & 204
er, 8 & 9
.... 180
.... 194
.... 87

.... 112

.... 189

When you think of jigs . . .

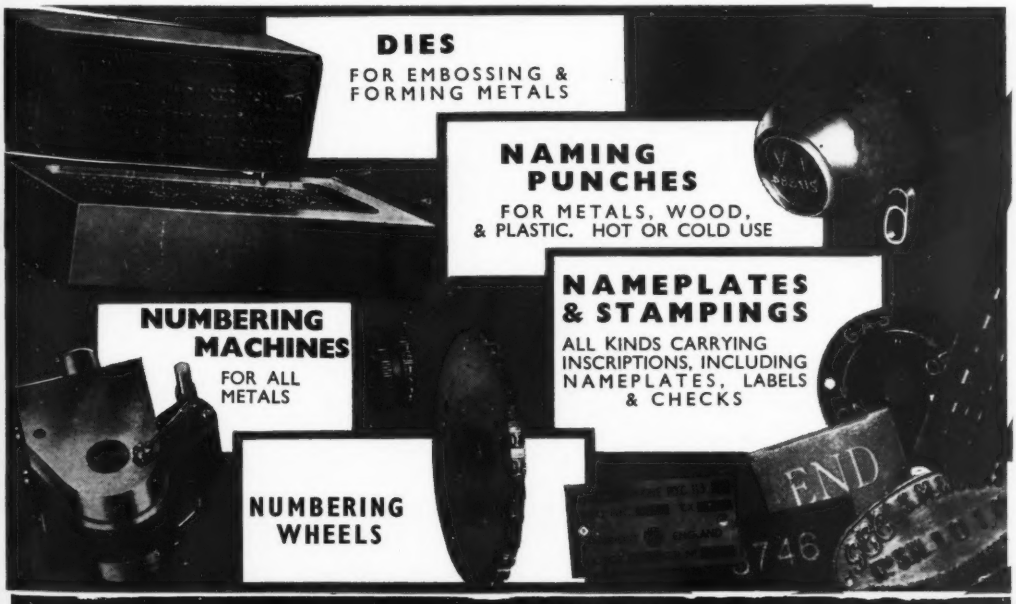
THINK OF

Grip JIG BUSHES

Manufacturers of the complete range of jig bushes and liners to B.S.S. 1098/1953, together with special purpose bushes for sheet metals, plastics, and moulded jigs.

Catalogues sent on request.

TRADE MARK


DIES
FOR EMBOSSING & FORMING METALS
NAMING PUNCHES
FOR METALS, WOOD, & PLASTIC. HOT OR COLD USE
NAMEPLATES & STAMPINGS
ALL KINDS CARRYING INSCRIPTIONS, INCLUDING NAMEPLATES, LABELS & CHECKS
NUMBERING MACHINES
FOR ALL METALS
NUMBERING WHEELS

H. B. SALE LTD

ESTABLISHED 1862 · PROGRESS WORKS
SUMMER LANE · BIRMINGHAM 19
TELEPHONE: CENTRAL 5661-3 GRAMS: SALE - BIRMINGHAM

B·S·A

HALL No. 2

STAND No. 2110

7th EUROPEAN MACHINE-TOOL EXHIBITION

BRUSSELS 3-12 SEPT

B.S.A. TOOLS LTD
STAND 2110

TRADE MARKS
B·S·A
TOOLS
DIVISION

machine tools, small tools, accessories, broaches, limit switches and, on adjoining stand No. 2007, The Churchill Machine Tool Co. Ltd. (B.S.A. Group), precision grinding machines.

B.S.A. TOOLS LTD · KITTS GREEN · BIRMINGHAM 33 · ENGLAND · Tel. STECHFORD 3071
B.S.A. SMALL TOOLS LTD · MONTGOMERY STREET · BIRMINGHAM 11 · ENGLAND · Tel. VICTORIA 2351
B.S.A. BROACH CO. LTD · REDDITCH · WORCS · ENGLAND · Tel. REDDITCH 3291

Cables:— MADRICUT BIRMINGHAM TELEX 33-207

Published by THE MACHINERY PUBLISHING CO., LTD., at their Office, Clifton House, 83-117, Euston Rd., London, N.W.1. Telephone Euston 8441.
LONDON: HARRISON & SONS, LTD., by Appointment to Her Majesty The Queen, Printers, London, Hayes (Middx.) and High Wycombe.

aston 8441.
Wycombe.